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Original Communications.

REMARKS ON AND TREATMENT OF PATIENTS IN THE SKIN CLINIC OF THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

By J. Abbott Cantrell, M.D.*

GENTLEMEN:—While the general percentage of the disease eczema is placed at thirty-three, it is probable that these figures would be increased were all cases recorded; and, as this large percentage is based upon the experience of men well qualified to judge of cutaneous trouble correctly, it is proper that you, as general practitioners, should know something of the treatment of a disease forming so great a proportion as one-third of all cutaneous diseases.

It will be greatly to your advantage that most of our patients to-day are sufferers from that disease.

Jacob S., aged 15 years, presents himself for the first time, having an eruption covering the entire face and surrounding the neck, which has lasted full three months. Noticing the condition closely, we find scattered here and there a typical vesicle, while the remainder of the face is covered with a crust. The neck is inflamed, although not acutely, the whole surface being decidedly itchy.

* Chief of the Skin Clinic.

We have here a typical vesicular eczema, and it might be advisable to state that, previous to the present eruption, the boy says he had ivy-poisoning in the same locality, although we can safely exclude that disease from the diagnosis to-day because this disease has lasted three months, a length of time unlikely in dermatitis venenata. If you notice the borders of the present disease, you see that we have a decisive point in favor of eczema, for, besides having the oozing, we have the disease fading into the surrounding healthy skin. We often notice that eczema is a follower of poisoning by ivy.

In the treatment of a disease of this kind, we must first remove the crust, so that we will not have any barrier to the desired effect of the treatment. To remove the crust, we will apply a starch poultice, or an olive oil dressing, either of which will remove it, if properly attended to, in a few hours, leaving the skin entirely clear of crust. While we have a decidedly moist eruption, with a crust forming rapidly, we have also an inflammatory trouble before us, and we wish to remove these conditions at one and the same time. For this we have recourse to several applications, using either a saturated solution of boric acid in water, or black wash, from five to ten grains to the ounce, and applying either of these continuously for a period of half an hour, twice daily, then drying the parts, and incasing them in an ointment dressing, either a calamine, or a mild calomel ointment, or the ordinary zinc ointment, adding, as we have a decided tendency to itching, about ten grains of carbolic acid. Following these instructions implicitly, we will find that this boy's face will be almost well in about two weeks.

This woman, the second patient, who is 60 years of age and a domestic servant, states that the present condition has lasted for the past four months, although she has had repeated attacks for the last four or five years. The palms of both hands are so stiff in the mornings that, without using an olive-oil dressing, she would be unable to do her daily work. The hands you notice are greatly swollen, while the skin in each palm is thickened, and at each joint you see a crack with slight bleeding, the edges of the fissure being heavy and rough. On the dorsal surfaces you see that all the linear markings of the skin are clearly perceptible at a distance, the knuckles being very much thickened and prominent. Around the nails the tissues much resemble the condition found in paronychia.

We have here the disease generally referred to as chapped hands, although it is very much aggravated. The cause of this trouble is, of course, the almost continuous immersion of the hands in water, and that they are not properly dried.

In treating this affection, you must first remove, as far as possible, the cause; but in this patient's case, as she must work for a living, she is obliged to do some of the things which would otherwise be interdicted.

After softening the edges of the fissures with a starch poultice, which should be applied for at least two hours, we then should use a permanent impermeable dressing, as long as possible at each time. After the condition is made more favorable for curative measures, we will then apply a salicylic acid or resorcin ointment, ten or fifteen grains to an ounce of ointment base, preferring the most soothing,—namely, zinc oxide. Apply this twice a day, and cover with paraffin-paper and a bandage; and, after a week, follow it with a sulphur sublimate and pix liquida application, using from one-half to one drachm of each to an ounce of ointment.

This condition will take at least some months to relieve entirely, and the patient should be under strict discipline, with frequent observation of the disease.

This man is 40 years of age, and presents a disease similar in character to our first patient, although it is in a different locality, it being confined to the arms below the elbows, distributed entirely on the extensor surfaces of both forearms and the dorsal aspect of the hands and fingers, the disease not having attacked any of the remaining portion of the body. He states that it is recurrent, reappearing generally every winter for the past five or six years, although not having been so severe as the present attack. We notice that the disease is of a decidedly moist character, being here and there crusted, and presenting at the upper border several full-formed vesicles, while the remainder of the disease has coalesced, forming one large patch. We also see that it bears a resemblance to the former cases,—that of fading into the surrounding healthy skin. He states that the arms are so stiff that he is almost unable to perform flexion, at least without causing much pain, and that on account of the irritation he is unable to go to sleep until far into the night. We turn our attention, first, to the crust re-

moving it by the same process mentioned in the preceding case, then apply a soothing as well as a curative ointment. I know of none better than a calomel or resorcin ointment, with zinc oxide as a base, using twenty grains of either of these ingredients to the ounce, with about fifteen grains of carbolic acid to relieve the itching. Another admirable form of treatment would be a salicylic acid paste, which may be made as follows: Salicylic acid and carbolic acid, of each ten grains, using mucilage of acacia as a base with a slight quantity of powdered starch to thicken it. This may be applied directly on the parts two or three times a day, and covered with paraffin-paper, and then bandaged securely.

This man, the fourth case, also presents the lesions seen on the former patient, but not so extensively. The disease is confined entirely to the wrists and back of the hands and fingers, being both vesicular and moist. He states that the condition gets almost well during the summer, only to break out again almost at the first sign of cold weather. It has lasted in all five years, never having been entirely well. He is a blacksmith by trade, being obliged to have his hands near the fire continuously, but previous to working at this he was employed in oil-works, and this evidently has been the first exciting cause. The disease presents the same characters as those previously seen, and as generally found in cases of eczema, and will be found to be a decidedly aggravating case to treat, inasmuch as he is obliged to work as a blacksmith. After removing all bad effects, as far as possible, we may apply a twenty-five per cent. solution of glycerole of subacetate of lead, one or two drachms to an ounce of ointment base, or the diachylon ointment of Hebra, made as follows:

℞ Olei olivæ opt., ℥v;
Pulv. lithargyri, ℥i;
Aquæ, q.s.
Mix by aid of heat.

The next patient you see is an elderly man, presenting an eruption over the extensor surface of the right leg and dorsum of foot, this condition being more of a subdued inflammation than any of the preceding cases, although we still have a form of eczema,—eczema rubrum. On inquiry as to the duration of this trouble, we find that he has had it for at least fifteen years, he being now 75 years of age. We find also that the whole leg, from hip to foot, is one mass of varicose veins, and near the inner malleolus he had an ulcer five years ago, which had existed between four and five years. Owing to the varicose condition, we have a diminished as well as a poorly-nourishing blood-supply to the parts, and also an entirely different condition to treat from that previously shown you. As the itching is of an intense variety, and as we are not hampered with a moist eruption, we apply simply a carbolic-acid lotion, three drachms to the pint of water, to relieve the itching, and have the leg encased in a silk-elastic stocking to protect the blood-vessels, preventing a possible rupture. If these conditions are complied with, we will give this man decided relief; if not, we may look for the breaking of a vein, followed by an ulcer, which will, of course, take some time to cure, the man being in a decidedly worse condition than at present.

Willie H., aged 2 years, has had the present eruption almost from the day of his birth. He has a silver-dollar-sized crusted patch on the centre of each cheek, with several vesicles scattered here and there over the forehead, cheeks, and chin. Around the anus we notice also several small crusted lesions, with a few papules on the buttocks. The father and mother, as you see, are both hearty, as is the child itself, neither his parents or grandparents having suffered from a similar disease. One of the best treatments to be applied to a child of this age, presenting a disease so chronic in character, would be, a drachm of pix liquida in an ounce of collodion, painting this on the face three times a day, being exceedingly careful to keep it away from the eyes, on account of the stinging effect of the collodion. On the remaining portion, a calomel, resorcin, salicylic acid, sulphur sublimate, or pix liquida ointment, using ten or fifteen grains of either to the ounce of the ointment of zinc oxide, increasing this proportion as necessary, may be applied twice or three times daily, keeping the parts well covered.

We must also look to the general condition of these patients, correcting any derangement that may exist in the digestive tract, looking also to the general tone of the patient, and removing any rheumatic or gouty diathesis as far as possible either by the use of medicine or the restriction of diet, or both, as the case may be, seeing also that the intestinal canal is always free. A favorite formula of dermatologists, combining aperient properties, is as follows:

"MISTURA FERRI ACIDA."

℞ Magnesii sulphat, ℥i;
Ferri sulphat, ʒss;
Acidi sulphurici dil., fʒi;
Sodii chloridi, gr. x;
Infusio quassiæ, q.s. fℨiv. M.

Sig.—Give a tablespoonful of this mixture in a goblet of water, preferably warm, one-half hour before breakfast, and repeating before the evening meal, if necessary.

The prognosis will depend upon the gravity of the case, its duration, and the tendency to recurrences.

One more interesting case presents itself for the first time, showing an eruption, which appeared on Sunday afternoon, now two days ago. Noticing the condition closely, we find a group of vesicles, each lesion discrete, and surrounded by a reddish-pink areola, the whole patch in turn having the same areola. A few of the more central lesions have broken and discharged serum, forming a crust,—a condition rarely found in the disease before us. The man states that before the appearance of the eruption he complained of a burning sensation of the affected parts, and that on the appearance of the eruption it changed to more of a neuralgic character, and that since the lesions in the centre have broken the pain is more intense.

We have here an acute vesicular eruption, being preceded by a burning sensation and followed by pains of a more intense character. We exclude eczema, because it is never so acute, and though the lesions may be discrete, they have a tendency to coalesce, with a history of discharging serum, with crusting the rule, and being more of an itching sensation than that of neuralgia; while in the herpetic eruption before us we have a discrete eruption, which does not coalesce, and one in which the lesions do not tend to rupture spontaneously, which is the rule in the former disease. The lesions here break down only by being bruised, and then we have an aggravation of the pain. As I have explained that the pains get worse if the lesions are ruptured, we must, if possible, prevent this. If the pain is not intense, simple remedies will do. If the pain is severe, the stronger sedatives must be used. A drachm of bismuth subnitrate to a half ounce of ointment may be used, this generally sufficing, or, with a view of preventing the rupture of the vesicles, we may use collodion, painting it on two or three times a day, and when the pain is very severe adding one or two grains of morphine.

Generally, in addition to these remedies, we also have a nervous individual to treat as well, and we wish to advise sedatives in connection with the external treatment, using possibly the bromide of sodium or lithium as frequently as necessary. This disease does not tend to form scars, although that accident has been noticed.

1010 SOUTH THIRD STREET.

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*CARBOLIC ACID AND ANTIPYRIN.**

A BRIEF STUDY OF THE ALTERATIONS INDUCED BY TOXIC DOSES, WITH REPORT OF AN UNUSUAL CASE OF CARBOLIC-ACID POISONING.

BY W. J. WILKINSON, M.D., PHILADELPHIA, PA.

INTRODUCTION.

PRELIMINARY to the consideration of this subject, one is confronted by the faulty and uncertain condition of the chemical analysis usually resorted to in the study of these drugs. It is highly questionable if any test is known for determining their presence in the urine.

In case of poisoning by members of the phenol group, until within the last few years the perchloride-of-iron test was considered sufficiently accurate. It is now known, however, that other drugs than carbolic acid will give reactions similar to, if not identical with, it, and these, by their large numbers, add confusion to our already limited store of knowledge. Modern chemistry does not seem to have elucidated this matter, and only added to the confusion by the discovery of new compounds in the urine, many of them found in health, which react as do members of the phenol group.

The above facts the writer presents as an excuse for this preliminary study. The case to be reported in this thesis is one unique in its history and pathological process. The writer is not aware that any of the cases of carbolic-acid-poisoning which have been reported have been associated with any preceding pathological lesion in the kidneys, and, as it is asserted as a fact that carbolic acid leads to and produces marked inflammatory process in the kidney, the writer has deemed it of sufficient interest to report a case of well-

* This paper is an abstract of experimental and laboratory work done in the Laboratory of Pathology of Jefferson Medical College, under the direction of Dr. Coplin, Demonstrator of Pathology and Lecturer on Hygiene.

marked kidney-disease, complicated by accidental carbolic-acid-poisoning, which terminated in death.

The opportunity for making such a report is rare, and it is only to be wished that it could be more fully reported. The writer, in studying the lesions attributed to carbolic-acid-poisoning, has found that the kidney is pointed to as the most active organ in determining a fatal ending. In the light of the present case, and in some experiments which are to be narrated later, the writer desires to express a different view of the case and the immediate cause of death. It is to be hoped that such a study as has been made of this subject, although of necessity brief, may develop more clearly reasons for such statements, as will be found in the concluding remarks.

It is primarily to be assumed that, if the essential lesion in the suppression of urine was a nephritic one, the kidney would show, either post mortem or otherwise, the process attributed to it, and if, as is usually alleged, although the writer is unable to find in literature any statement to that effect, the kidney epithelium participates in the process, we would expect to find well-marked alteration in its histological elements. This alteration should be constant, and we should be able to reproduce it at will, just as we produce the hepatic lesions of phosphorus-poisoning. It is rare in the present day, with our minute knowledge of normal and pathological histology, that we have a drug so much used in surgery and medicine, of which we know so little of its ultimate activity. There is also a high degree of importance to be attached to it, not only from its own action, but from the fact that the materia medica is being rapidly overloaded with new and intricate chemical compounds, whose stability, to say the least, is doubtful. Now, if, as the writer believes, many of these, at certain times and under many conditions, not at present thoroughly understood, break up in the system into carbolic acid or other recognized toxic members of the group, it behooves us to understand what the dangers are and upon what basis they would act as poison. The writer became interested in the study of this process before he received the small fragment of kidney from the case used as the text case of this paper, and it is needless to say that its most gratifying factor consisted in the fact that it showed just what the writer believed,—namely, that the kidney was not the organ most affected in the changes produced by the "phenol group." Before proceeding further, let us see what were the symptoms, history, and result of the case.

The history of this case may be briefly stated as follows: The patient was a young girl of 17 years of age. She had suffered from scarlet fever when four years of age. This had been followed by an acute nephritis, resulting in dropsical manifestations, affecting more particularly the lower limbs and the abdominal cavity. Exactly how long this lasted cannot be ascertained, but has been approximated by the family as "about" two months. She then apparently recovered, being an anæmic, slowing-growing, delicate child. At the age of twelve she contracted pneumonia, affecting the right lung. It ran a typical course, and terminated in recovery, followed by the same dropsical troubles which had evinced themselves after scarlet fever. The writer could obtain no notes of any examination having been made of the urine, and only infers that it was a case of albuminuria or Bright's disease. The dropsy which had followed the pneumonia ran practically the same course as its predecessor, only that it lasted nearly a year, growing better slowly, was associated with shortness of breath and dimness of vision, headache, and other symptoms, such as are well marked in kidney-troubles of this character. The doctor, to whom the writer is indebted for the history of the case, first saw the girl when fifteen years of age. She then had the well-marked symptoms of contracted kidney. There was marked anæmia, so much so that she had been in the hands of the doctor for several months, and was being treated for pernicious anæmia.

Dr. White, to whom the writer is indebted for this history, made an examination of the urine, and found it loaded with albumin, accompanied by a large number of casts. The patient was then put upon the usual treatment resorted to in this class of cases. Iron was one of the important remedies used, and seemed to give more relief than anything else, for the anæmia and many of the other symptoms materially abated, and the girl's general health so improved that she did not deem it necessary to consult the doctor any further. In October, 1890, by mistake, she took nearly an ounce of carbolic acid and glycerin. The exact quantity of carbolic acid taken was estimated at about one drachm. Immediately recognizing her error, an emetic was administered, which produced free emesis. This was accompanied by the

usual treatment for carbolic-acid-poisoning. Two hours after having taken the poison she passed an ounce and a half of smoky urine. This was the last urine that she voided, and twenty-three hours after taking the poison she died in convulsions.

Examination of this urine was made in Dr. Coplin's laboratory. The post-mortem was made fourteen hours after death. There were no notes made of the appearances, and, on account of the most remarkable carelessness in observation, we know almost nothing. The stomach and œsophagus were noted as being a "leaden white," whatever that may be, and no examination was made of the heart or lungs, although one of the physicians in attendance wrote that he thinks the "heart was enlarged, but it was not taken out."

Two small fragments of the kidneys were sent, and one little fragment from the margin of the liver; also about eleven drachms of urine, which was in the bladder, eight and a half drachms of which were sent immediately, with specimens, to Dr. Coplin. We then wrote and obtained the above incomplete statement of facts. Examinations were made, and the following facts were noted: Of the urine voided before death, it was observed that the reaction was acid. Specific gravity, 1027.

Albumin.—Esbach's albuminometer showed the presence of four per cent. of albumin.

Hæmoglobin.—This was shown to be present by Heller's test.

Bile Pigment.—The faintest play of color by Gram's test, so faint that it was a matter of doubt if any were present; but Dragendoff's method gave much more positive results, so that the test was considered satisfactorily sure.

Erlich's test seemed very faint indeed.

Urea.—Quantitative examinations of the urine showed the presence of .8 per cent. of urea.

Phosphates.—A small quantity.

Carbolic Acid.—The most careful testing could not prove the presence of this drug. The writer regrets that he did not make a test for simple sulphuric acid, an important factor pointed out by Jaksch, but not spoken of in "Taylor on Poisons," to which the writer referred at the time.

Of the urine removed from the bladder, the specific gravity was 1011. Reaction faintly acid. Of albumin, no trace could be demonstrated.

The tests for bile and blood pigments showed enormous quantities, and the reaction so intense that no differential point could be made, as the tests for one seemed to react for both, and neither seemed to react alone; so that the condition was one rather of melanuria, not at all like that described as occurring in patients suffering from pigment growths.

Urea could not be demonstrated as present.

Carbolic acid was not present, either by tests, nor after shaking the urine up with ether, decanting the latter and allowing its evaporation, could the faintest odor of the acid be detected.

Kidney: Macroscopic Appearance.—Cortex thin; slight red striation in the outer margin; no yellow striation; entire organ slightly diminished in size; capsule more firmly attached than normal; margin on section straight; evidence all pointing to beginning contraction.

Microscopic Appearance.—There is well-marked fibroid changes in the organ, showing evidence of age, as well as some alterations, which may be considered recent, although not within the last few hours of life. There is no evidence of thrombosis or intravascular clotting; indeed, nothing to point out that the carbolic acid had acted upon the kidney, as is usually reported in such cases. At points the renal epithelium is degenerating, but this change is evidently old, and many of the tubes are entirely normal. There is a small-celled exudate between the tubes, but this shows all ages of organization, and none of it is very recent. There is no swelling between the tubes. No blood-casts in the tubes.

EXPERIMENTAL PATHOLOGY.

Carbolic Acid.—In order to study the processes induced by carbolic-acid-poisoning, and by the administration of so-called synthetic compounds, the writer determined to resort to experiments upon animals.

A large rabbit was selected, and I administered 1 drop of carbolic acid every other hour for eighteen consecutive hours. The animal, at this time, showed no evidence of general poisoning, so he was given a 2-drop dose at 12 M., and left alone until the following morning. This experiment was made on February 27. Examination of his blood was made at the time of each injection; the carbolic acid was given mixed with two drops of glycerin and one-half drachm of sterilized water. These injections were renewed on the following morning, as they had been on the previous day; the rabbit showed no evidence whatever of carbolic-acid-poisoning. Seeing that it was requiring very large doses to bring on

any effect, the dose was slowly increased to 5 drops, and repeated every two hours until symptoms evinced themselves, which occurred after the fourth injection. The rabbit now became restless; its pupils dilated; its respiration seemed quickened and more shallow; its ears lopped back, and the animal did not seem endowed with the power of raising them. This was followed by muscular twitchings, inco-ordination, inability to stand, and final unconsciousness; slight convulsions, or rather slight convulsive movements, terminating in coma and death at 3 P.M. At the post-mortem no odor of carbolic acid could be detected about the animal; the organs were apparently healthy, the liver seemed slightly congested, and the heart had stopped, with its right cavity enormously distended; the lungs were apparently normal, not even showing very marked congestion; the kidneys did not seem to be normal, and, although the animal had been noticed to urinate several times prior to its death, the bladder contained one-half ounce of typical smoky urine, but this did not seem to give off the odor of carbolic acid in the slightest degree. The bile seemed very dark-colored, looking almost as though it contained blood.

Specific gravity of the urine was 1032. Reaction, acid; no albumin; no sugar.

Blood and bile pigments were present in enormous quantities. Diluted with twice its bulk of water, the reactions for blood-coloring matter could be obtained. The blood and bile pigments are considered together, for the writer could not isolate their reactions. Carbolic acid not present. Hydrochinon is present, as shown by vaporizing a residue.

Microscopical examination of the urine shows a large quantity of epithelial cells, no blood, no casts, no crystalline deposit. As further proof of the absence of carbolic acid, moulds rapidly formed on the surface of the urine, and bacterial growth, soon rendered it turbid.

A study of the blood of the rabbit, compared with the blood of a control rabbit, kept in the cage with the poisoned one, was made.

The first three blood counts were made on the day before the experiments began, in order to ascertain if there was any peculiarity in the rabbit's blood, or if it differed materially from that of the control rabbit.

Time.—Time at which the observations were made.

No.—Number of corpuscles counted in a square on the Thoma-Zeiss apparatus for counting blood-corpuscles; the number per cubic millimetre may be easily obtained by multiplying this number by 4000 × 100. For example: 12 × (4000 × 100) = 4,800,000

	Experiment.		*Control.*		
Time.	No.	Per cent.	No.	Per cent.	Remarks.
3.45 P.M.	12	84	11.3	68	February 27.
5.00 P.M.	10.2	67	12	71	
6.30 P.M.	10.25	67	11.5	68	
6.00 A.M.	10.5	69	10.5	66	February 28, first injection.
8.00 A.M.	11	68	12.5	69	
10.00 A.M.	11.5	67	12	68	
12.00 M.	10	66	11	69	
2.00 P.M.	10.5	68	11.5	64	
4.00 P.M.	9.8	71	11	68	
6.00 P.M.	6	14	11.8	71	
8.00 P.M.	8	61	10	72	
10.00 P.M.	7.6	65	10.8	74	
11.45 P.M.	6.3	68	11	71	
12.00 M.	...	...	...	...	Injected 2 drops March 1.
6.23 P.M.	7	67	9.8	68	
8.00 A.M.	6.5	68	10	66	Slowly increased to 5 drops.
10.00 A.M.	6	64	10.5	64	
12.00 M.	5.4	67	11	67	
1.00 P.M.	6	63	12	65	
2.00 P.M.	5	68	11.5	68	15 drops.
3.00 P.M.	4.4*	69	...	...	Died.
	6†	67	...	...	Quantity of drug given 45 grains.
	4‡	31	...	...	
	5§	48	...	...	
Average	8.17	65.2	11.15	67	

* Blood from vena cava above liver.
† Blood from vena cava below liver.
‡ Blood from splenic vein.
§ Blood from left ventricle.

per cubic millimetre. The number obtained is the average of sixteen squares counted.

Per cent.—Percentage of hæmoglobin as estimated by hæmometer.

The figures in the second row are arranged under the same signs as the first, and show the result of examinations in the control rabbit.

NOTE.—The control rabbit used in this case is the one used for the antipyrin experiment.

MICROSCOPICAL STUDY OF THE ORGANS.

The Kidney—Both organs are altered alike. The glomeruli are swollen and somewhat granular; the epithelium of the convoluted tubes is swollen, granular, and at points many of the nuclei have disappeared, and their places are filled by vacuoles. The conducting tubes show the effect of either the excretion of the poison or the carrying of it down to the pelvis of the kidney. As they are not supposed to be endowed with the power of excretion, it is to be presumed that they are altered from contact. A small number of the vasa recta are thrombosed, and some of these intravascular clots show age and beginning organization, a process which goes on rapidly in this organ.

The Liver.—The hepatic structure stains unevenly, some points deeply, others staining but little, and some not at all. The epithelium of the bile-ducts does not seem altered. The margins of the lobules seem more affected by the poison than the central or intermediate zones. Many of the liver-cells can be found without any nuclei, and in some vacuoles not at all resembling fat, although this substance can be seen largely interspersed throughout the organ. Some of the branches of the portal vein and some of the hepatic vein are thrombosed. Other organs are normal.

ANTIPYRIN.

The rabbit used as a control in the carbolic acid experiments was selected for the study of this drug.

As the writer had on several occasions tried the administration of antipyrin to rabbits, and being aware that enormous doses must be given in order to affect these animals, he started in by the administration of 5-grain doses, dissolved in sterilized water, every two hours, exactly as he had done with the carbolic acid. Like the carbolic acid, this was continued eighteen hours the first day and twelve hours the following day, at which time a half drachm of the drug was administered. The symptoms of poisoning in this rabbit were identical with those of the other rabbit, and outsiders, who had not the remotest idea of what was being done with the rabbits, were asked to examine closely for any differences in symptoms, invariably each examiner expressed his belief that both animals were poisoned by the same drug, and death ensued in the second rabbit exactly in the same manner as it had in the first.

The condition post mortem in this rabbit differed from the first only in that the second rabbit had both sides of its heart widely dilated, and that the urine was not smoky. The bladder contained seven drachms of urine, the specific gravity of which was 1028. Reaction, neutral; a trace of albumin; no sugar. Slight reaction for blood pigment, but none for bile pigment. Reaction identical with that of the carbolic acid, but requiring longer heating to develop the precipitate, which is not so dense when fully formed. Bacterial growth did not develop, as in other urine, and mould inoculations failed to grow on the urine.

STUDY OF THE BLOOD.

As the rabbit was the one whose blood had been examined and recorded on the previous day, it was not thought necessary to use a control. The same letters and signs are used at the head of the columns as in the carbolic acid experiment, and have the same explanation.

Time.	No.	Per cent.	Remarks.
6 A.M.....	11	69	March 2.
8 A.M.....	11.5	67	
10 A.M.....	10.5	68	
12 M.....	11	64	
2 P.M.....	10.3	68	
4 P.M.....	8.5	65	
6 P.M.....	9	71	
8 P.M.....	8	67	
10 P.M.....	8.5	65	
11 P.M.....	8	61	
7 A.M.....	11	64	March 3.
9 A.M.....	9	68	
11 A.M.....	8	63	
1 P.M.....	8.5	68	10 grains.
3 P.M.....	7	69	
5 P.M.....	6.5	64	
6.30 P.M.....	5.5	...	30 grains.
7 P.M.....	6*	68	Died.
	5.5†	71	Total amount of drug, 145 grains.
	4.5‡	52	
	7§	61	
Average.....	8.2	65.5	

* Blood from vena cava above liver.
† Blood from vena cava below liver.
‡ Blood from splenic vein.
§ Blood from left ventricle.

Average of same rabbit before the administration of the drug was 11.15 and 67, respectively, showing a net decrease of 2.95, if calculated on the general average. This basis is not, however, the correct one, as it considers a disappearance of not less than 1,180,000, when, in fact, counts ran as low as 1,600,000, a total loss of 3,200,000, or nearly four-fifths of the entire number of corpuscles. This will be considered later on.

MICROSCOPICAL STUDY OF THE ORGANS.

The Kidney.—Both organs are altered alike. One is struck at the outset with the contrast between these and the carbolic acid kidneys. In them the glomeruli are swollen and granular, while in these they are surrounded by a young cell exudate, at least many of them are, and the granular change is less marked. There is a swelling between the convoluted tubes, and in many points identical with that so often seen in the contracting kidney, which is undergoing a fresh outbreak of inflammation. This change can be seen throughout the organ, and even along the straight vessels of the conducting portion of the pyramid. In one or two of the tubes, blood-casts can be seen; but, taken all in all, the epithelium is far better than in the other kidneys. The cellular exudate between the tubes is recent.

The Liver.—This organ shows the same changes as in the carbolic acid specimens, except that they are more marked. The granular change is more advanced, and faulty staining almost constantly present throughout the section.

The bile was so light in color that it did not stain blotting-paper, and gave but the slightest reaction for coloring-matter.

CONCLUSIONS.

The writer believes, after a rather comprehensive study of the literature of poisoning by the phenol group, that he has entered into a new field of experimental pathology.

In the reported investigations of cases and experimental work, the blood is always noted as normal. This is an error. The urine is always reported as giving off the odor of carbolic acid in poisoning by that drug. This is also incorrect, as shown by the urine from the reported case, and as noted in the experimental work.

The character of the blood-changes demands the closest study, and as the writer believes it is described for the first time, he proposes to lay stress upon it. As this can only be verified by the closest possible clinical study of patients taking these new members of the phenol group, it is to be hoped that the future work will more fully establish the amount of injury which may or may not be accomplished by these compounds. In the first place, the condition of the blood induced in the animals is one of oligocythæmia rather than oligochromæmia, as the reduction of the red-blood corpuscles is not accompanied by any alteration in the percentage of hæmoglobin. This may be accounted for by either of two hypotheses:

1. The destruction of red corpuscles is accompanied by transference of their hæmoglobin to unaltered corpuscles, thus not reducing the quantity of hæmoglobin; or,

2. The poison may not interfere with the production of hæmoglobin, while the regeneration of corpuscle-making process is in a state of suppression. That the latter theory is not unlikely is supported by the fact that the blood-coloring matter, or a similar compound, is being excreted all the time, as denoted by its presence in the urine, which, if true, must mean that coloring-matter is being manufactured in order to make up the quantity lost. The animals experimented on were evidently suffering from oligochromæmia, for the control and pre-experimental study developed a small percentage of hæmoglobin; in fact, a reduction of not less than thirty-three per cent. of the normal human unit. These animals differ but little in the amount of hæmoglobin from the human.

The reduction of the corpuscles is not accompanied by any apparent alteration in form or appearances, as may be noticed by examination of the spreads, but which was shown much better by the blood in the fresh mounts with cover glass and neutral oil rings. Although not noted in the experiments, several counts were made of the white corpuscles, at irregular intervals, which demonstrated that they were not affected.

The writer does not venture any opinion at present as to the cause of different results in the blood-counts of the contents of the vena cava above and below the liver, also splenic vein and auricular blood. There may be reasons, not at present obvious, but he desires to reserve his opinion for the time being.

As the general nutrition is supposed to bear a constant relation to the amount and quantity of the blood, any agent, therapeutic or prophylactic, which disturbs this equilibrium must be used with care, and administered only when necessity demands it.

The writer is of the opinion that the whole subject of the urine—its constituents, compounds, and products—require the closest study in connection with the application of these remedial agents. Too many of the observations, current in standard works on toxicology, need a thorough review, closer study, and a minute, scientific, chemical test.

The only writer who seems aware of the chaotic condition of our knowledge upon this subject is Professor Jaksch, of Prague.* In the chapter on the urine, in his work on "Clinical Diagnosis," he indirectly brings out the similarity in the excrementitious compounds found in the urine of patients taking some of the synthetic products of modern chemistry. By examining the chapter above referred to, the reader will see that he asserts that carbolic acid is largely excreted as sulphuric acid compounds and as hydrochinon, and for the first time, in the literature to which the writer has had access, calls attention to the fact that simple testing with solution of chloride of iron gives a reaction essentially different from that alleged to occur. He commends examination for the sulphuric acid, and shows the fallacy of the method of distillation usually advised. The reader is struck with statements like the following:

Carbolic acid (page 284): "Pure phenol is never present. . . . It serves little purpose in cases of carbolic-acid-poisoning to attempt an estimate of the phenol which passes over as tribromo-phenol in the process of distillation."

He goes on to advise the same tests for other members of the group.

Salicylic acid (page 286): Here he refers to the reactions of the perchloride of iron, and under the same head discloses the fact that salol reacts with a "tint varying from dark-green to black, like that following the use of carbolic acid;" and goes on to state that "both salol and betol appear in the urine as sulphuric acid combinations," thus carrying out the idea asserted early in this thesis.

Antipyrin (pages 286, 287): "Estimation . . . has shown that antipyrin is eliminated as a sulphuric acid combination."

Antifebrin (page 287): "Chemically, it has been ascertained by F. Müller, that it (the urine) contains more than normal proportion of ether-sulphuric acids."

Phenacetin (page 287): "Exhibits the paramido-phenol reaction." That is to say, it reacts like other members of the group.

It does not seem to the writer necessary that he should go any further multiplying proofs of the identity, in product, of these and other members of this group. It does, however, become our most fervent duty to question the advisability of using these drugs to any large extent, and more especially to falter before the wholesale and indiscriminate use of the agents, whose toxic effects, under many and varied forms, is proven beyond the remotest possibility of a doubt.

Furthermore, as many, if not all, of the members of this group are excreted as one and the same thing, hardly changing in form, is it not well to assume that their physiological action is largely dependent upon the production of a similar compound, either during or after absorption? Which brings us flatly to the point where their toxic value reaches a standard unit.

Materials producing similar compounds and almost identical systemic effects are rarely benevolent under one name and richly malevolent under another. The enterprise of the manufacturing chemist must be met with sound judgment, and thoughtful, scientific research.

In this paper the writer has avoided reference to the similarity in the chemical atomic formulæ of these drugs, and merely begs that the doubting reader may take the time to closely scrutinize their apparent relation.

Before closing this study, the writer would for a moment call the reader's attention to the pathology of the reported experimental conditions.

That the members of this group do induce important lesions in the essential elements of secreting glands is proven by the condition of the liver and kidneys herewith presented. It is of more than passing interest that the tendency towards tubular trouble is well marked in one case, while the interstitial form of nephritis is certainly more marked in the other.

In the alteration in the liver we may have some possible evidence to show how the temperature is affected, at least, if not how it may elucidate other hepatic changes, supposed to be thermal in point of origin. One cannot avoid surmising the possibility of the suppression of urine being due either directly to the alteration in the blood or to the structural changes in the liver. It is admitted that the urea production is largely due to the action of the liver, and with this in mind, the

* "Clinical Diagnosis," by Rudolph v. Jaksch; translated by Cagney.

diminution of urea secretion can be more thoroughly understood. If these drugs, as above noted, alter the parenchyma of kidney and liver, why not other glandular structures? This deserves most careful study, and the writer would be pleased to examine any organs from cases of poisoning by members of the phenol group.

THE DANGERS OF ANÆSTHESIA BY ETHYL BROMIDE.

By John H. Brinton, M.D.*

In the January number of the Therapeutic Gazette reference is made to a lecture recently delivered by Julius Witzel before the Dental Society of Frankfort-on-the-Main, in which the results of four hundred and sixty-five cases of anæsthesia by bromide of ethyl are given. The opinions of the lecturer are strongly in favor of this agent. He believes it to be the safest and most available anæsthetic in our possession, and he urgently recommends its general use. The circumstances of the lecture and the great number of cases would justify the inference that the exhibition of this anæsthetic has been limited to dental operations, and that the degree and duration of its effect have been presumably far less than are required for ordinary surgical practice. The sweeping conclusions which have been arrived at do not seem entirely warranted, and it is well to hear more of bromide of ethyl before accepting as final the dental experiences which have been narrated.

Bromide of ethyl, discovered in 1827, was not largely and practically employed as an anæsthetic until 1879, when the late Dr. R. J. Levis, of Philadelphia, introduced it, first in the Pennsylvania Hospital, and afterwards in the hospital of the Jefferson Medical College, and in his extensive surgical practice. It continued in use until the summer of 1880, when its exhibition was generally discontinued, in consequence of two deaths resulting from its effects,—one in Philadelphia and one in New York.

In the early part of 1880, influenced by the example and enthusiasm of my then colleague, Dr. Levis, I employed bromide of ethyl as an anæsthetic in between forty-five and fifty surgical operations of greater or less gravity. At the same time I had many opportunities of observing its workings in the practice of my colleague. I found, as has been claimed, that its exhibition was marked by great rapidity of action and by quick recovery of sensibility on its withdrawal. The stage of excitement was comparatively short and slight, and the patient, after very few inspirations, succumbed to the narcotic effect. The resulting insensibility was complete, and lasted during the inhalation. When this was discontinued, the recovery was instantaneous and almost magical, and full intellection seemed to be at once established. There was seldom any nausea or vomiting. Sometimes a little drowsiness followed, but usually the subject emerged from his soporific condition as quickly and as gently as he had passed into it. Its action seemed the same on patients of all ages,—children, adults, and old people.

On my first trials, I thought that the ideal anæsthetic had been found, but on larger and closer experience, peculiar phenomena were manifested. In many instances I observed a tendency to muscular rigidity, affecting the flexors and extensors equally. Sometimes special groups of muscles on the upper or lower extremities were involved. Occasionally the spasmodic contraction was more general, as in the whole length of the back. Several times I witnessed complete opisthotonos, the patient resting on his heels and occiput, with the characteristic arched and rigid back. The abdominal muscles frequently underwent excessive and knotted contraction, and this spasmodic action often showed itself in a remarkable degree in the cremaster muscles. In one case of castration, after a retaining loop had been carried through the substance of the cord and the latter divided, so powerful was the action of the cremaster, that the cord was instantly torn away from the hold of the string, and dragged up so that its bleeding end rested at or inside the internal ring. It was only reached by splitting up the inguinal canal in its entire length. In a second case of castration the same violent contraction of the cremaster was present, but was controlled by anticipation.

Another peculiarity attendant upon the anæsthesia of bromide of ethyl is the degree and violence of the arterial hemorrhage. This must be caused by increased arterial tension, and was briefly alluded to by Dr. Levis, in his article on "Ethylization," published in *Medical Record*, March 27, 1880. In the same paper he says that muscular action or rigidity may be occasionally mani-

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fested. It was this frequent and marked muscular rigidity, amounting to general tetanic spasm, which first led me to doubt the safety of bromide of ethyl as an anæsthetic. In consequence of this suspicion and of the evident tendency to excessive and apparently unnecessary hemorrhage, I discontinued its use shortly before the occurrence of the two fatalities which led to its general abandonment by the profession. One of these occurred in a young man about to undergo lithotomy. The death was instantaneous, and without premonition, and was not sufficiently explained by the post-mortem appearances. It probably was due to some cardiac cause.

In view of my own observations, I cannot, therefore, concur in the eulogistic opinions expressed before the Dental Society, but must continue to regard bromide of ethyl as being far from an innocent therapeutic agent; and, on the contrary, as one of the most dangerous anæsthetics we have yet essayed.

For an account of "Anæsthesia by Ethyl Bromide," with a full bibliography, the reader is referred to the paper of Dr. H. Augustus Wilson, *Medical and Surgical Reporter*, Philadelphia, August 7, 1880.

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*THE TEACHINGS OF EXPERIENCE AND OF RATIONAL THERAPEUTICS AS TO THE TREATMENT OF PNEUMONIA.**

By Boardman Reed, M.D., Atlantic City, N. J.

(Concluded from page 171.)

THE differences in the results shown by these military statistics are so striking that it is important to look more closely into the modes of therapeusis followed.

In the Northern army during the War of the Rebellion the treatment was described in the surgeons' reports, and these have been ably summarized.

Dr. Charles Smart, writing on this subject,[25] states that general depletion was rarely employed, and characterizes the treatment during the fever as "timorous, vacillating, and tending to expectancy," but praises the vigor with which stimulants, tonics, and extra aliment were given on the appearance of asthenic symptoms. It is evident, however, from the detailed reports of numerous cases, that some of the surgeons resorted to more energetic measures in the direction of attempting to equalize the circulation, using veratrum viride or aconite with sweet spirit of nitre, spirit of mindererus, etc. Quinine was also given to many cases. But a stimulating and otherwise expectant treatment seemed to be most in favor, and previous to the account of the autopsy it is usual to find the therapeutic measures summed up briefly as "stimulants, expectorants, Dover's powders, and poultices."

At some of the hospitals a purely expectant plan was often followed.

As to the line of treatment which yielded such splendid results in the Prussian army during the period of 1868 to 1878, Dr. Hugo Engel, a German physician, now resident in Philadelphia, has kindly written me a full account. He says that pneumonic patients were, so far as practicable, treated in open, detached villas, to insure plenty of cool, fresh air. For high temperature or delirium, cold wet packs were kept applied till the sensorium was clear and the temperature reduced. These packs were removed as often as necessary, and formed the main treatment.

In very young and vigorous men, when the attack was severe and great dyspnœa or a cyanotic face indicated it, venesection was practised; but the wet packs generally sufficed. Twelve to sixteen wet-cups were applied to the seat of pain when this was severe and the engorgement considerable. The internal treatment consisted either of tartar emetic in broken doses or of tincture of veratrum viride in violent cases. In the older or asthenic cases, digitalis formed the remedy, and strychnine was early added in case of threatened heart-failure.

When there were nausea and vomiting, or a thickly-coated tongue, with or without jaundice, a heavy dose of blue mass, or calomel, 10 to 15 grains, was given, and followed in six hours by a saline purge. "This," Dr. Engel adds, "is said to have prevented or aborted many a case of croupous pneumonia."

Juergensen was one of the first to teach that pneumonia is an infectious and self-limited disease, yet taught and practised a most energetic treatment.[26] He advocated the direct abstraction of heat by tepid, cool, or even, if necessary, cold baths, with a free use of stimulants both before and after each bath. He also gave quinine in large doses, which was of more questionable advantage. He has cited some statistics, showing highly favorable results. Of two hundred cases

* An abstract of this paper was read before the Medical Society of the State of New York, at the annual meeting, February 2, 1892.

treated on his plan at the Kiel Polyclinic, only twenty-four died, a mortality of twelve per cent.; and of forty-eight at the Tübingen Polyclinic, there were six deaths, a mortality of 12.5 per cent. Juergensen also quotes from Fismer statistics showing that at the Basle Clinique two hundred and thirty cases of pneumonia treated during the years 1856 to 1866, without antipyretic measures, yielded a mortality of sixty (26 per cent.), while in the same number of cases treated at the same institution from 1867 to 1871 by baths and various antipyretics, including quinine, veratrine, and digitalis, the number of deaths was thirty-eight, or 16.5 per cent.

It is a manifest inference from the foregoing statistics—military and civil—that even an excessively energetic treatment of pneumonia has saved a larger proportion of lives than the expectant method. If this has not been proved, then no amount of clinical experience can be depended on to prove anything in medicine.

The statistics from the Prussian army establish the fact also that by the help of hydrotherapy and a rational yet perfectly safe use of certain active drugs, a still larger proportion of lives can be saved in the same disease. In favor of similar methods—similar as to their essential principle of striving to bring about derivation of the excess of blood from the inflamed lung to the surface or elsewhere—a large amount of clinical testimony is at hand.

Pepper, in 1882, urged the importance of vigorous measures at the outset of pneumonia, since the first forty-eight hours usually determined the result, and warned against the dangers of "premature stimulation." He recommended cooling, diaphoretic, and diuretic drinks, and prescribed for severe cases veratrum viride and wet-cups, and even advised a general bleeding in the beginning of the most sthenic cases.[27]

Baginsky has recently reported one hundred and forty-seven cases in children treated between September 1, 1890, and August 1, 1891, thirty of them having been genuine cases of croupous pneumonia, without a single death. The treatment included wet-packs of ten minutes' duration three times a day at a temperature of 60° to 70°; also stimulants,—sherry or port.[28]

As a rule, the methods of treatment which, in recent years, as well as in the older times, are claimed to have achieved exceptionally favorable results, involve active and energetic interference, especially in the first stage.

The advocates of a merely expectant and supporting mode of treatment in acute pneumonia have brought forward a few small isolated collections, such as that of Bennett, of Edinburgh, who reported one hundred and twenty-five cases, with only four deaths; but, when we come to analyze the latter, it appears that Bennett administered salines, colchicum, and nitrous ether, all these being useful, and some of them decidedly active antiphlogistic remedies.

On the other hand, even a cursory glance through the medical literature of the past twenty years reveals many earnest and forcible pleas in favor of *doing something* to save pneumonic patients, many of these protests against prevalent inactive methods being fortified by strong arrays of successful cases.

In numerous instances country physicians, far from the medical centres, have worked out for themselves methods of subduing the violence of this dreaded disease, their various plans all agreeing in diverting the excess of blood away from the engorged lung, whether through purgation, diaphoresis, and diuresis, active counter-irritation, or several of these combined.

Some of the leading clinicians of the cities have recently been working on these lines, and with most promising results.

Andrew H. Smith, in a recent most able paper, read in Berlin, at the Tenth International Medical Congress,[29] called attention to the importance of watching the embarrassed right heart even more closely than the left heart, on account of the overfull venous system and obstruction to the pulmonary circulation; and also advised restoring the balance to the disturbed circulation by all practicable means.

He conceded that many cases of pneumonia had been saved by the lancet, but urged that we could do better still by bringing about a more even distribution of the blood between the venous and arterial systems, through the use of certain drugs, such as the nitrites and aconite, which relax the arterial system.

He also pointed out clearly how too large an amount of even liquid diet may not only burden the inactive digestive organs, but also overcharge the vessels with an unassimilable, because unoxidized, nutriment, which the economy is still further embarrassed to get rid of. Dr. Smith's paper embodies an earnest and emphatic protest against the modern practice of full feeding in pneumonia.

He thinks, if we must overfeed a pneu-

monic patient, it would probably be better that his food should be of a less digestible character, as the excess would do less harm in the alimentary canal than in the blood-vessels.

Dessau has lately preached a similar doctrine, emphasizing the importance of keeping up free diaphoresis by such drugs as aconite, spirit of mindererus, spirit of nitrous ether (an efficient nitrite), and Dover's powder, so as to relieve the engorgement of the lung, right heart, and the whole venous system. He also advocated warm baths (in children), frictions to the skin, and followed Fenwick in recommending the ice-cradle in very sthenic cases.[30]

Veratrum viride has been largely and most successfully used, during the first stage especially, combined often with spirit of mindererus, as well as with small doses of opium, and sometimes also with non-nauseating doses of tartar emetic.

Pepper, Wood, Garretson, and Hare, of Philadelphia, have all borne strong testimony to the value of veratrum in the first stage of pneumonia, while some continue its use in lessened doses so long as high fever persists.

The elder Flint in his later years used either aconite or veratrum viride in the first stage of sthenic cases, and taught that with caution they could be given advantageously often in the second stage also.[31]

The possibility of aborting pneumonia by even a moderate and entirely safe use of veratrum viride, variously combined, has been attested by the experience of many physicians, including that of the writer.

Ergot and jaborandi, or pilocarpine, are other drugs for which not only rapidly curative, but even abortive, power has been claimed in this disease.

R. T. Stratton, in a recent article, reported five cases of catarrhal pneumonia which were aborted in the first stage by means of the following:[32]

℞ Ext. ergotæ fl., ♏xx;
Tr. aconit. rad., ♏i to ii;
Liq. ammon. acetat., ʒiiiss;
Syr. tolut. q.s. ad ʒss. M.
Sig.—To be taken every two hours.

Dr. Stratton attributes the abortive and curative powers of this combination mainly to the ergot; but, substituting wine of antimony for the ergot, the prescription would be almost identical with that by which various other physicians have accomplished similar results.

O. J. Roskoten reports having aborted four out of five of his cases of pneumonia by means of full doses of jaborandi and liquor ammonii acetatis.[33]

L. B. Tuckerman reports uncommonly good results from small doses of pilocarpine in conjunction with aconite, tartar emetic, and morphine.[34]

J. W. Small has treated over three hundred cases of acute lobar pneumonia in the last twenty years, and states that when he has been called before the disease has progressed beyond the first stage, *he has never failed to break it up within twenty-four or forty eight hours.*[35]

His method includes the administration internally of aconite, Dover's powder, and nitrate of potassium, and locally hot mustard pediluvia, and frictions over the feet, legs, thighs, and arms with hot water till the parts are quite red, followed by covering the patient warmly in bed, and further promoting active diaphoresis by hot bottles, hot-water bags, etc. Hot flaxseed-meal poultices are then applied to the chest.

A. Livezey, of Bucks County, Pa., in a private letter, informs me that, in a practice of forty-seven years, he does not "remember *ever losing a case of pneumonia or pleuro-pneumonia.*" Even in his early practice he did not resort to venesection, though he was sufficiently energetic in other ways. He began with "a slow emetic" of ipecac and boneset, and gave as a purgative either calomel or "physic tea." Afterwards he cupped and drew thoroughly with cotton saturated with alcohol and fired; then he scarified. He says, "After stomach and bowels were cleared, a cupping would often break up the disease,"—that is, abort it. If this did not happen he gave aconite or veratrum viride in small repeated doses, and applied a good-sized blister, with the result that "*in from thirty-six to seventy-two hours the patient was uniformly convalescent, if seen early.*" In other cases the disease would sometimes run a course of two or three weeks. When this happened, he gave alterative doses of calomel and ipecac, with aconite or veratrum, and sometimes iodide of potassium; occasionally a second or third blister. In later years he has modified his practice somewhat, but has always relied in part on either aconite or veratrum viride. This treatment "was pretty strong," as he writes, but it succeeded, and other experience shows that its severest

features might have been omitted without interfering with its success.

The late Fordyce Barker reported well of veratrum viride in pneumonia.[36]

G. R. Martine has written ably in advocacy of bringing and holding the pulse below 80 in pneumonia by the use of any efficient cardiac sedative, preferably veratrum viride.[37] He declares emphatically that "substantially it never fails, insisting that by holding the pulse below 80, in this way consolidation can always be prevented.

William Martin bears testimony that cases of pneumonia seen early can be aborted by veratrum viride, and when not seen till in the second stage, convalescence can be hastened by the same remedy.[38]

In a recent noteworthy paper, entitled "Forgotten or Much Neglected Remedies," Caleb Green put in a strong plea for the use of antimony, with or without a preliminary bleeding, to cut short pneumonia in the first stage, insisting that in this way it can be aborted.[39]

Even Juergensen admits that "pneumonia is sometimes aborted by energetic treatment."[40]

Burggraeve and his disciples—the Dosimetrists—claim to abort, or "jugulate," as they prefer to call it, most acute diseases, and are reporting numerous cases of pneumonia which have been arrested in one to three days by the free and frequent administration of their granules of aconitin, veratrine, digitalin, strychnine, etc.

Petresco, of Bucharest, also claims to abort pneumonia within twenty-four hours, and to have reduced the death-rate in a series of upward of one hundred cases to two per cent. by administering every half-hour an amount of infusion of digitalis representing five grains of the drug. He claims that these enormous doses are safe and rapidly curative.[41]

Greene, of Colorado, also aborts pneumonia, and thinks he has discovered a specific germicide remedy for the disease in peroxide of hydrogen.[42] He saturates the patient with the drug as soon as possible, administering to adults from one to three teaspoonfuls of Marchand's, Drevet's, Herb and Frerich's, or any other of the fifteen-volume solutions, well diluted, once in three to five minutes, for an hour or more. He adds: "The same dose may then be given half-hourly or hourly till convalescence is established; and it should be crowded as at first any time, if dyspnœa returns." The only ill effects noticed are occasionally nausea and vomiting.

Even very young children are said to bear it well, the vomiting, when it happens, being useful to remove the phlegm, and they can take proportionably larger doses than adults.

Greene believes that a preliminary dose of calomel at the outset promotes the cure, and in typhoid types advises giving oil of cinnamon in frequent doses besides the peroxide. He reports one hundred and fifty-seven undoubted cases of pneumonia treated by the peroxide of hydrogen, with only three deaths, a rate of 1.9 per cent.

Fieandt reports in the *Duodecem*—a Finnish medical journal—one hundred and six cases, with a mortality of only 2.8 per cent. The treatment was ice locally, with ipecac, digitalis, and opium internally.[43]

The plan followed hitherto by myself in acute lobar pneumonia has been to place the patient in a well-ventilated room, having a temperature of 65° to 70°, giving all the cold water he desires, and at first so much of simple bland nourishment as his appetite demands; no more. When called early, my beginning prescription has usually been about as follows:

℞ Tr. verat. vir., ♏xvi;
Vin. antim., ʒi;
Tr. opii deod., ♏xx to xxx;
Liq. ammon. acetat., q.s. ad ʒiv. M.

Sig.—Two teaspoonfuls in a draught of water every two hours, day and night.

I have never found it necessary to increase these doses, but in an exceedingly violent case in a robust person should not hesitate to make the dose of the veratrum 1½, or even 2, minims every two hours, until the circulation came under control. In addition, 2 grains of quinine have usually been administered three or four times a day.

In asthenic cases the dose of veratrum has often been ½ a minim instead of 1 minim (though the larger dose has never been observed to depress to any hurtful degree), and then a strong tincture of phosphorus (1 to 1000) has generally been administered in 1-minim doses each alternate hour. This powerful stimulant of the nervous system is used in pneumonia by some of the best British and continental therapeutists, and has been greatly lauded by the homœopathists for the same disease. Dr. Faria, of Brazil, reports excellent results from the administration of 8 drops of an ethereal tincture of phosphorus in threatened asphyxia from pneumonia in infants, and has found it useful in senile broncho-pneumonia.[44]

In young children it has been usual with me to give tincture of aconite, since in them veratrum viride sometimes produces an irritable stomach. Opium and tartar emetic, in doses much smaller than are usually prescribed, together with sweet spirit of nitre, and appropriate doses of the liquor ammonii acetatis when the stomach will bear it, complete the combination most frequently relied on. But when, as so often happens in infants, I have had to deal with gastric irritability in addition to the pneumonia, I have preferred to administer oft-repeated doses of aconite simply dissolved in water, with the small doses of phosphorus (which never disagree) as an alternative remedy. Quinine suppositories, in tonic doses, are often used as well, one twice a day.

As for the treatment of the second stage of lobar pneumonia, my experience counts for little, since in adults I have rarely had it to treat. The remedies already mentioned, when begun early, have almost uniformly terminated the disease in the first stage. In the few less fortunate cases I have either suspended altogether the veratrum mixture, or else continued it in a reduced dose, and administered the small doses of phosphorus and quinine above mentioned, adding to the treatment suitable quantities of alcohol and cardiac tonics, as required.

In the second stage of broncho-pneumonia I have often given muriate of ammonia with good results.

In one desperate case of a child with pneumonia of the right lung, pleuro-pneumonia on the left side, and pleurisy of the diaphragm, there was seriously threatened paralysis of the respiratory centre and heart at the time of resolution. This was my own son, a lad of 8½ years, who had been taken sick while away at a boarding-school, and brought home on the third day. A number of my colleagues had been kindly attending him, when he was rescued from an apparently moribund condition coming on in the night by large and repeated doses of strychnine, digitalin, and atropine, which I administered to him hypodermically, with no other hope at the time than that of rallying him sufficiently from his unconscious state to admit of his recognizing before death the other members of the family. He finally recovered, after undergoing thoracotomy for empyema.

A child, 2½ years old, which I have seen in consultation with Dr. J. C. Massinger, in the neighboring town of May's Landing since beginning the preparation of this article, was found in a condition bordering on collapse, with general capillary bronchitis and lobular pneumonia of the right base. Its temperature was 102° in the axilla, 105° in the rectum; pulse abnormally slow, and only fair in volume; respiration feeble and gasping, with deep unconsciousness and no cough. It had just had a second convulsion. Hydrotherapy was here summoned to our aid. While tubs of hot and of cold water were being made ready, strychnine sulphate, grain $\frac{1}{100}$, was given hypodermically; also an enema containing tr. camphor, five minims; tr. digitalis, one minim; and tr. veratrum, one-quarter minim. Then the child was placed in the warm bath (100°), and while held in this, towels soaked in cold water were slapped over its back and breast to stimulate respiration and cough. Once or twice it was quickly submerged in the tub of cold water, and then replaced in the warm. It was taken out occasionally, placed in a warm blanket, and briskly rubbed; then replaced in the warm water; and, finally, kept there till the temperature of the water fell to 80°. Later the stimulating injections were repeated; and at last success crowned these efforts, the child recovering.

As to local measures, in my earliest cases I employed jacket poultices; later a jacket lined with cotton. I have now become convinced of the great value of cool or cold water locally, and expect to employ it hereafter in exceptionally severe cases at least.

In cases of delayed resolution and in chronic pneumonia I have obtained very gratifying results from persistent counter-irritation, with internally a good syrup of the hypophosphite of sodium.

I have seen no deaths from the acute lobar form of the disease in my own practice, and have lost but two cases of the lobular form, both in children, and both complicated with protracted and intractable whooping-cough, which had worn the little patients out. The first of these fatal cases was treated by me during the earliest part of my professional life, when experience was lacking. The last one came to me from Philadelphia in the latter part of winter, after a long siege of whooping-cough and bronchitis, complicated more recently with lobular pneumonia, and with an irritable stomach, besides being in such a feeble condition that anything more than merely supporting measures were scarcely to be thought of. Even this child, mainly from the change of climate, improved decidedly at first, and returned to Philadelphia better; but, after two or three weeks, was brought back to the shore worse again in some respects, and, after contracting an additional cold, through a change of boarding-place, went down rapidly.

During the recent epidemics of influenza, I have seen a good many cases complicated by that peculiar form of pulmonary congestion and exudation which has been aptly called "grippe pneumonia," four cases thus complicated having been observed in persons over seventy years old. All recovered.

My treatment of catarrhal or lobular pneumonia has of late been substantially the same as described above for the lobar form. The

veratrum has more frequently been given in half-doses, and the phosphorus more generally administered as an adjuvant. In the grippe cases, camphor, and sometimes digitalis and atropine have been combined in a capsule with the tonic doses of quinine.

How much the stimulating and aseptic sea-air of Atlantic City has had to do with my results, I do not attempt to decide. Certain it is that primary pneumonia is a rare disease in the place, and the purity of the air has no doubt been a helpful factor in the treatment. Full notes have not been kept; but, including all the forms of pneumonia, primary and secondary, I have in the past fourteen years treated sixty-four cases, with two deaths. All the cases of acute lobar pneumonia (and most of the cases of lobular pneumonia) to which the mixture of veratrum, antimony, opium, and spirits of mindererus, was administered from the beginning in my usual doses, were aborted within thirty-six hours.

Summing up these clinical results from many different sources, we find that by far the lowest death-rate in any very large series of cases was that reported from the Prussian army, embracing forty-two thousand four hundred and sixty-seven cases, with a mortality of 3.6 per cent., the treatment having been mainly hydriatic, derivative, and sedative in the first stages and stimulating in the later ones. Remarkably good results have also been obtained by various observers, who have employed methods similar, except that the wet-packs, and often the wet-cups, were omitted, reduction of the temperature and derivation to the surface having been effected by veratrum viride or aconite, with active diaphoretics, aided by the use of either poultices, cotton-lined jackets over the chest, hot mustard-water applied to various parts of the body, or other local derivative measures.

Reducing high temperatures, stimulating the respiratory centre, and diverting the blood to the surface, have been effected also with excellent results by different forms of baths.

The extraordinary results said to have been obtained from the administration of very large doses of digitalis do not seem to have been confirmed outside of Bucharest, and it is probable that such an exceptionally heroic use of this drug is neither safer nor more efficient than the combinations of veratrum, as to the results of which there is now a very large recorded experience.

Concerning the treatment of pneumonia by saturating the system rapidly with the peroxide of hydrogen, it would seem to be well-deserving of a wider trial, especially in asthenic cases.

Experience, then, has abundantly proved that acute primary pneumonia can be aborted —*i.e.*, terminated in the first or beginning of the second stage—by a plan of treatment, including internally, frequently-repeated moderate doses of veratrum viride, combined with adjuvants which dilate the capillaries of the skin and body generally, at the same time that they stimulate the kidneys and support the heart; and externally, either such hydrotherapeutic measures as will most conveniently meet the threefold indication of lowering the temperature, diverting blood from the inflamed area, and stimulating the heart and respiratory centre, or other local energetic measures by which the same results can usually be accomplished less promptly and certainly, but also with less opposition from the friends of the patient. The same plan when instituted too late to abort the disease, has still proved the most curative of any of which extensive trials have been made. Two other abortive methods—that of giving enormous doses of digitalis every half-hour, and that relying upon very frequent full doses of hydrogen peroxide—have yielded extraordinary results, each in the hands of a single observer, though in a series of over one hundred cases.

So far the argument has been *a posteriori*, —based on observed or empirical results,— and medicine is still largely an empirical art. We are all looking hopefully ahead for the better day that is coming; but, in the past, attempts to found new modes of treatment of various diseases upon an immature pathology and an imperfect knowledge of the powers of drugs, though occasionally successful, have been followed by some dismal failures; and such an attempt is directly accountable for the retrograde movement which has actually increased the death-rate from pneumonia. The notion that, because the newer pathology assumed pneumonia to be an infectious, self-limited disease, and therefore the use of active means of interference was illogical and unnecessary, has dominated the treatment of this disease in most parts of the world for some thirty years past, with what results the foregoing statistics show.

But assuming what has not yet been scientifically established, that a microbe is the efficient cause of pneumonia, a fuller knowledge of bacteriology has recently made us acquainted with the fact that by far the best

germicide is healthy blood-serum, and that to restore the natural circulation of the blood in any bacteria-infected region is often the surest method of getting rid of both the bacteria and the diseased process induced by them. Therefore, if, as is most probable, microbes have somewhat to do with the etiology of pneumonia, drugs, or remedial measures that relieve the engorgement and restore a more normal circulation in the affected part, must still be the most efficient means of cure.

Two of our most distinguished therapeutists—Wood and Hare—have each on *a priori* grounds urged in the strongest terms the propriety of administering veratrum viride in the first stage of pneumonia. Wood especially insists that one advantage of the veratrum over venesection is that the former bleeds the patient into his own abdomen, leaving the blood to be used again when needed; and points out that while veratrum temporarily depresses the heart, it does not exhaust it.[45]

Hare recognizes two remedies only as "of great value" in the first stage,—bleeding and veratrum viride. Concerning the latter, he says, "Its two alkaloids—*jervine* and *veratroidine*—possess different influences, and between them fulfil every object that is sought after. *Jervine*, a powerful vaso-motor depressant, relaxing the walls of the blood-vessels everywhere, at the same time quiets the action of the heart by an action over its muscle or ganglia, so as to reduce its force, thus preventing engorgement of the lung; while *veratroidine*, by stimulating the inhibitory nerves of the heart, also slows its beat, fills the ventricles, and allays excitement."[46] Both Wood and Hare advise substituting digitalis for the veratrum in the second stage.

As to the diaphoretics, diuretics, and various local derivative measures which have formed a part of most of the successful methods already described, the rational indications for them have been sufficiently explained. The *rationale* of the hydriatic procedures that have been shown to be so efficacious in pneumonia will be found very fully discussed by Juergensen, in his article on "Pneumonia," in Ziemssen's "Cyclopædia," and by Baruch, in Hare's "System of Practical Therapeutics," vol. i.

The small doses of quinine and phosphorus, which form a part of my own most frequent plan of treatment, are probably not essential to the aborting of pneumonia,—that is, the other remedies mentioned are, in my opinion, usually sufficient to abort an attack when the administration of them is begun within six hours of the onset, and continued day and night, in even the moderate doses recommended. But, whenever for any reason these more active remedies cannot be thus pushed, or have failed to cut short the attack, the two tonics have seemed to be distinctly helpful in bringing about a cure. Both are universally recognized as roborant to the heart and various parts of the nervous system when administered in relatively small doses, and are known to be capable of exerting toxic effects in their largest doses. When ingested in poisonous amounts, both have occasionally produced congestion of the lungs, and having been thus shown to specifically affect the lungs, it is a fair inference that both will exert their most valuable tonic and restorative influence upon those structures in comparatively small doses. Small or moderate doses of tartar emetic and opium are diaphoretics, and by their sedative influence are synergistic with the veratrum and spirits of mindererus in dissipating the engorgement of the first stage; but, as is the case with veratrum, are liable to do harm in the later stages, unless the doses be considerably reduced.

From the foregoing statistics and clinical reports, the following conclusions seem to be fully justified,—viz.:

1. That water locally applied, either by wet-packs or in the form of baths, after the Brand method, is the most efficient single remedy or therapeutic measure for acute pneumonia.

2. That either veratrum viride or aconite can accomplish more than any other single drug in the first stage, and that the same is true of digitalis as to the second stage.

3. That a combination of one of these cardiac sedatives with opium and diaphoretics affords not only a safe but eminently successful internal treatment for the first stage of acute pneumonia, being capable of aborting the disease when its administration is begun near the onset and repeated at short intervals day and night.

4. That venesection, though a most efficient means of treating sthenic forms of pneumonia, and, judiciously employed, considerably more successful than any merely expectant method, is no longer an indispensable resource in managing the disease, since other remedies have been found to accomplish the same results more surely and more pleasantly.

[45] "Med. and Surg. Hist. War of Rebellion," Part III., Med. Vol., pp. 750–810. [46] Ziemssen's "Cyclopædia," article 'Pneumonia." [47] *Phila. Med. News*, November 11, 1882, p. 533. [48] *Archiv für Kinderheil-*

kunde, Heft iv., v., vi., Bd. xiii. [29] "Some Considerations in Regard to Acute Obstructive Diseases of the Lungs," by Andrew H. Smith, A.M., M.D. (*Am. Journ. Med. Sciences*, October, 1890). [30] "The Treatment of Croupous Pneumonia in Children," by S. Henry Dessau, M.D. (*Archives of Pediat.*, September, 1891). [31] "Flint's Practice," 4th ed., Phila., 1873, pp. 188–191. [32] Dr. R. T. Stratton, in *N. Y. Med. Rec.*, December 19, 1891, p. 753. [33] Dr. O. J. Roskoten, in *Med. Rec.*, May 2, 1891, p. 512. [34] Dr. L. B. Tuckerman, in *Med. Rec.*, June 6, 1891, p. 652. [35] Dr. J. W. Small, in *Med. Rec.*, June 6, 1891, p. 665. [36] Dr. F. Barker, in *Amer. Practitioner*, October, 1870. [37] Dr. G. R. Martine, in *Journ. Am. Med. Ass.*, September 21, 1889, p. 412. [38] Dr. Wm. Martin, in *Phila. Med. News*, November 1, 1890. [39] Dr. Caleb Greene, in *Phila. Med. Times*, September 18, 1886, pp. 917, 918. [40] Op. cit. [41] *Med. Rec.*, July 4, 1891, p. 14. [42] Dr. J. L. Greene, in *Med. Rec.*, February 6, 1892, p. 141. [43] *Med. News*, August 31, 1889, p. 238. [44] *Med. Rec.*, January 14, 1888, p. 55, quoted from *Revue Générale de Clinique et de Thèr.* [45] *Med. News*, January 18, 1890. [46] "Text-Book of Practical Therapeutics," by H. A. Hare, M.D., Phila.

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*ON THE VALUE OF THE INHALATIONS OF CHLORINE GAS, AND THE USE HYPODERMICALLY OF IODINE AND CHLORIDE OF GOLD AND SODIUM IN THE TREATMENT OF PULMONARY CONSUMPTION.**

BY HENEAGE GIBBES, M.D.,† AND E. L. SHURLY, M.D.‡

OF the twenty-seven cases whose clinical histories were reported in the THERAPEUTIC GAZETTE last April, we have been able to trace, by letter or otherwise, up to the latter part of January, twenty-six. One we have not been able to hear from since last September (1891), at which time she was reported to be steadily improving.

The following statistics are based upon information received up to the latter part of January and first part of February.

Of the twenty-seven cases, thirteen (or 48.14 per cent.) are practically well. Nine (or 3.33 per cent.) have died (one case is reported to have died of typhoid fever last September, and one after parturition). Three of them were reported in the previous article. Four (or 14.8 per cent.), although still living, are gradually growing worse. One (or 3.7 per cent.) (not heard from), condition not known.

Of the thirteen cases, eight have remained at their Northern homes, while five have moved to more salubrious climates.

The following abstract of thirty-two cases has been taken in regular order from about one hundred recorded in the case-books of Harper Hospital.

The plan of treatment for these cases has not differed very much from that adopted in the management of the formerly reported ones, excepting that we have acquired from experience more skill in adapting and varying the dosage to individual conditions.

Mrs. G. K., wife of physician; aged 34; native of Canada; resident of Chicago; hygienic surroundings good; habits good; has worked hard; family history good; has had cough for eighteen months, growing worse; expectoration very free; last four months considerable pain in chest; no hæmoptysis, chills, fever, and nocturnal sweating during last six months; progressive emaciation and anorexia; no menstruation for last four months; more or less diarrhœa; very weak,—scarcely able to "be up." On entrance to hospital, February 10, 1891, her pulse was 120, small; temperature, 102.5°; respiration, 26.

Physical Exploration.—Chest emaciated; respiration shallow; dulness on percussion at both upper fronts and back; several cavities in each lung, as shown by cavernous respiration; pectoriloquy, gurgling râles, etc.; bronchophony and bronchial respiration also in spots behind; tubercle bacilli numerous in sputum.

Treatment.—Hypodermic injections of iodine (one-twelfth to one-sixth grain), and then gold (one-twentieth to one-fifth grain).

This patient remained until April 16, 1891. After the first week she grew better, and materially improved for about two weeks, as exemplified by increase of strength, diminution of expectoration and night-sweats, and lowering of temperature. However, she left the hospital somewhat worse than at the beginning of treatment, and we have learned that she died about one month after reaching her home in Chicago.

E. H., male; aged 29; single; German; has lived in United States about ten years; cigar-maker; habits fair (smokes about five cigars a day).

Family History.—Mother and maternal uncle died of phthisis; never been associated much with any one suffering from cough; says he

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* Abstract of the clinical histories of thirty-seven cases (of a series of one hundred), with a further report on the twenty-seven cases formerly published in the THERAPEUTIC GAZETTE.

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was never robust; has been subject "to sore throat" and slight cough mornings for years; had a severe hæmoptysis about a year ago, and a slight one last spring; since then has coughed and expectorated much more, and has been losing strength and weight; has had chills and fever irregularly, with night-sweating for last month or so.

Entered hospital February 14; pulse, 100; temperature, 100.5°; respiration, 24 (A.M.).

Physical Signs.—Considerable pain in left chest; dulness on percussion; bronchial respiration and bronchophony over upper right front and back; moist "click" on forced inspiration; tubercle bacilli in sputum; larynx hyperæmic, but showing no swelling or erosion; voice slightly hoarse; no odynphagia.

Treatment.—Hypodermic injections of iodine, one-twelfth to one-half grain for two weeks; then gold and sodium chloride, one-twentieth to one-third grain, for ten days; then iodine, one-half to one grain daily for two weeks; after that one-half grain iodine and one-third grain gold alternately; inhalations of chlorine gas in room twice daily for twenty-five minutes.

Internal Medication.—Rhubarb and sodium for constipation occasionally, and Huxham's tincture three times a day; extra nourishment between meals,—Mosquera's beef-tea and milk. He remained in the hospital until April 18.

During his stay the temperature gradually lowered, excepting for a few days while taking one grain of iodine daily. Cough and expectoration diminished, and tubercle bacilli gradually disappeared, so that on March 13 there were none found. On the 16th, examination of chest showed disappearance of bronchial respiration and bronchophony. He had gained eleven pounds; very little cough, excepting in morning, with the expectoration of about one drachm of a mucous character. He suffered afterwards from a cutaneous eruption, which was supposed to have arisen from the iodine.

We have seen him from time to time since up to this time, January 14, and excepting an occasional "cold" and outbreaks of eruption, he has remained well, working at his trade every day. He has had an injection of iodine and gold alternately every week or two weeks since.

Mrs. M. C. T., aged 37; widow; family history good; good hygienic surroundings; habits good of late; formerly was up at night, more or less, attending society events; very nervous; has been much exhausted since attending her husband during his last illness, and by other troubles since his death; never exposed to a phthisical case; never had hæmoptysis; always "in good flesh" until last eight months; has had chills and fever on and off for last two years; nocturnal sweating during last autumn; has had hacking cough, on and off, for some years; expectorates about five ounces daily; menstruation scanty; insomnia for last three months very troublesome.

Entered hospital February 28. In appearance very thin and sallow, also very weak. Respiration, 28; pulse, 110; temperature, 101° (noon); complains of weakness and disquietude.

Treatment.—Hypodermic injections of gold daily, one-twentieth grain, increasing to one-fifth for two weeks, excepting twice each week an injection of iodine (one-third grain); chlorine inhalations once a day; bone-meal (five grains) three times a day with Catawba wine; Mosquera's food, milk, and meat-balls for extra nourishment; soap-bath at night twice a week for two weeks.

This patient remained in hospital until April 21. During that time she gained strength and flesh, although the tubercle bacilli never disappeared from the sputum, which, however, was very much diminished in quantity. She was given from time to time, to meet indications, various drugs, such as quin., sulphonal, valer. am., mur. ammo., salicine, etc. She was of very unstable temperament, and consequently difficult to manage. When she left the hospital, physical exploration of the chest showed dry creaking, instead of gurgling râles, over the upper left lung. Her evening temperature never went below 99°, and ranged mostly between 99° and 100° during the latter two weeks of her stay. She was heard from in May, in California, from which place she wrote that she was very much better, though "short of breath" and still nervous.

Miss L. L., aged 21; Canadian; domestic; habits good; generally good hygienic surroundings; many of father's family died of phthisis pulmonalis. Patient has been tolerably well, though never very robust; never exposed to any case of phthisis. Cough began about November 1, 1890, and has continued more or less since, especially at night; expectoration at first "frothy," becoming yellowish and "hard"; had hæmoptysis about March 1, and cough, progressive weakness, emaciation, and fever more marked since; night-sweating not constant; chills or chilliness mornings for

last two or three weeks; some nasal catarrh (extra discharge) for last year; generally constipated; menstruation has continued, although scanty. Takes one good meal a day, as a rule, but has not a good appetite; some indigestion.

Entered hospital March 26 quite thin, pale, and weak. Respiration, 24; pulse, 130; temperature, 100.8°; pain in chest; expectorated first twenty-four hours in hospital four ounces; no tubercle bacilli present.

Physical Signs.—Dulness on percussion; creaking and mucous râles; bronchial respiration and bronchophony over upper left front; also crackling over upper right front on forced inspiration; also prolonged expiration.

Treatment.—Hypodermic injections daily of gold (one-tenth grain) for first week; then hypodermic injections of iodine (one-sixth to one-half grain) for two weeks; afterwards gold (one-fifth grain) and iodine every third night; bone-meal and house tonic (co. tr. gent. and tr. chamomile), milk, and beef-tea as freely as can be well borne; codeine at night for cough.

Patient remained in the hospital until April 14, and improved generally. There was much less expectoration; evening temperature, 99°; pulse, 94; respiration, 22.

Physical signs showed (April 14) no râles; lower pitched bronchial respiration; vocal resonance still exaggerated, and some dulness (though less marked) over upper left lung; adventitious signs had disappeared over upper right; heard (in August) that she was quite well, working as usual. She had slight cough, without much, if any, expectoration in morning. Saw her January 9; she was quite well, excepting for "asthmatic breathing."

Miss S. S., aged 15; Canadian; farmer's daughter; lived in low country, probably damp; lost one sister with phthisis; was with her more or less; was never very strong, and has had cough from childhood; never had hæmoptysis; cough and expectoration worse for last six months; also irregular chills, fever, and nocturnal sweating.

Entered hospital March 12; weak, but not very much emaciated. Respiration, 22; pulse, 90; temperature, 98.5° (A.M.). Some appetite; bowels regular; menstruation regular but scanty; tubercle bacilli in sputum; has bronchocele.

Physical Signs.—Dulness on percussion and bronchophony at right back, below spine of scapula up to apex; prolonged expiration and sibilant râles over upper right front, and jerky expiration; occasional dry râles over upper left front; expectorated about two ounces in first twenty-four hours.

Treatment.—Hypodermic injections of iodine (one-twelfth to one-third grain) daily for two weeks; then every other day; inhalations of chlorine and bone-meal (five grains) three times a day.

The temperature ran from 98° morning to 100.5° evening, up to the 18th, and gradually lowered, to a range of between 98° and 99.5° until the 4th of March, when it rose for two or three days to an evening temperature of 100°. From this time on it gradually approached the normal, and for a few days before she left the hospital it varied between 98° and 99° only, while the cough and expectoration had diminished greatly. She still coughed and expectorated some, however, when she left the hospital.

Examination of sputum showed (April 1) tubercle bacilli still present. But when she left the hospital (April 16) there were none, neither were there any present in a specimen of sputum examined May 16, 1891. She had injections of iodine once a week for about four weeks, and then every two weeks, until about November 30, since which time she has had no treatment. She still coughs a little in the morning.

This was evidently a case of pure bronchial catarrh, merging into subacute phthisis pulmonalis.

Miss I. S., aged 19; native of Detroit; domestic; hygienic surroundings usually good; family history good; never exposed to contagion of phthisis; has been generally healthy; thinks she began coughing about December 1, 1890, and has continued to cough and expectorate since; more expectoration lately of yellowish or grayish color; has been losing flesh; formerly weighed one hundred and twenty-six pounds, now one hundred and three pounds; had slight hæmoptysis in January last; has had chills, fever, and night-sweating more or less since; more regularly during the last month; no menstruation; severe diarrhœa on two occasions.

Entered hospital February 22, 1891; pale, spare, and somewhat weak, short of breath on exertion; respiration, 40; pulse, 120; temperature, 101.8° (P.M.); severe pain in left side of chest; tubercle bacilli present in considerable number.

Physical Signs.—Dulness on percussion; pectoriloquy; mucus and gurgling râles at right lower axillary region; bronchophony extending over the whole lower lung; mucous râles

at upper part of lung in front; broncho-vesicular respiration over other upper front, and increased fremitus.

Treatment.—Hypodermic injections of iodine (one-sixth grain); increased to one grain every night; one inhalation of chlorine daily; fomentations to relieve pain in chest, and codeine (one-fourth grain) and acetanilide (five grains) at night to lower temperature.

Concentrated Nourishment. — Mosquera's food, beef-tea, milk, etc.; three grains cinchonid. sulph. and one-fourth grain hydrastine (Alk) three times a day.

Temperature began to fall on the 28th, ranging from that time to March 12 about 98° to 98.5° (morning) to 99.2° to 99.4° (evening); March 12 to 20, temperature was higher, with chills in the morning.

As coryza, a metallic taste, and increased moisture of skin supervened, the iodine (of which one-half grain was given hypodermically daily) was stopped and gold given. Quinine and arseniate of iron were given for a few days. The inhalations of chlorine were increased to two daily.

From this on she improved, although there would be an occasional rise of temperature. April 2 she went out on a pass for twenty-four hours; returned on morning of the 3d, feeling worse, complaining of headache, feeling of malaise, etc.; said that she had perspired profusely the night before. She soon recovered, however, and continued gaining flesh and strength.

Hypodermic injections of iodine was alternated with gold (one-fifth grain) every other day.

She left the hospital finally April 15 in good flesh and feeling quite well. There were no tubercle bacilli in the sputum.

The physical signs were dry, creaking râles, and somewhat bronchial breathing all over right lung. The injections were kept up once a week, and then once in two weeks until October. In December, 1891, we saw her. She seemed quite well, and said there was little or no cough. The right lung still showed thickening, but no râles, and was in a measure permeable to air.

A. T. F., female; aged 21; native of Michigan; clerk; family history carcinomatous; has always worked hard; has been living in Iowa for the last year, and doing clerical work; before that did housework; says that she was generally well until last winter (1889), when she had "la grippe," from which she was disabled three weeks (being in bed only four days). The following April, 1890, was ill again, with a fever and great nervousness, from which she recovered, and in July following was taken with acute rheumatism, complicated with peritonitis, since which she has been ill. While recovering from this, began coughing, and soon expectorated large quantities of yellowish matter (supposed at that time by her medical attendant to be from abscess,—abscess of lung. She gradually grew weaker, with high temperature evenings; chills occasionally, and fever following, also night-sweats.

She entered Harper Hospital, November 17, 1890; was unable to sit up more than half an hour at a time; had been suffering from pain in right chest; profuse expectoration, chills, fever, and sweating, with diarrhœa on and off for last four weeks; respiration, 40; pulse, 120; temperature, 104° (afternoon); expectoration profuse, grayish, and heavy; large number of tubercle bacilli in the sputum; anorexia and indigestion, with nausea and vomiting; no laryngeal symptoms or odynphagia. (Urine examined on the 25th, and found to contain excess of urates.)

Physical Signs.—Dulness on percussion over lower left lung, with broncho-vesicular respiration and diminished fremitus; bronchophony and bronchial respiration over lower right, with large mucous and creaking râles over right front; no friction sound proper.

Treatment.—Acetanilide at night; hypodermic injection of iodine, preceded by cocaine (one-tenth grain) or morphine (one-fourth grain) every night. Inhalations of chlorine twice daily (in ward); Mosquera's food and spts. frumenti every four hours. Three grains cinchonidine and one-fourth grain hydrastine three or four times a day. The temperature ranged high on evening of every third day (105°) (followed by profuse perspiration and excessive cough) for about a month; then abated for a while. During December, 1890, two well-marked cavities, about four by six inches and three by four inches respectively, showed themselves in the right lung,—one at the base, and the other, smaller, at the infraclavicular region. About six weeks later another excavation showed itself at the lower lobe of the left lung. The expectoration was very profuse. She, however, could take and retain a considerable amount of concentrated nourishment and stimulants during this time. The temperature and pulse-rates continued high right along until about March 10, when these symptoms began progressively to subside. The

expectoration was also rapidly diminishing, although March 20 the sputum still showed tubercle bacilli. At one time (February) it appeared as though she was about to suffer from peritonitis, but the suspicious signs subsided in two or three days. This patient was subjected to the hypodermic injections and chlorine inhalations, with very little intermission. She began sitting up the latter part of February, and continued on the whole to improve. She was in the hospital until May 14, 1891. During April and May the evening temperature rarely went above 100°. She had several attacks of severe diarrhœa during this time. Just before leaving the hospital, the physical signs showed nothing but coarse respiration and creaking râles over the site of diseased portions of the lungs. Her appetite and strength was good. An examination of the sputum May 1 showed absence of tubercle bacilli. A great variety of medication was used from time to time to meet special indications, but the main therapeutic measures were the hypodermic injections and chlorine inhalations, with stimulants and nourishment. She spent last summer in the country, and was quite well. She appeared here in October last, looking fleshy and well. Said she had little or no cough, was still short of breath, but had neither ache nor pain. She still takes a hypodermic injection of iodine occasionally.

This is quite a remarkable case, inasmuch as it was variously diagnosticated as abscess of lung, peritonitis, general tuberculosis, and croupous pneumonia.

We did not suppose when she arrived at the hospital that she would recover. She was seen while in the hospital by many physicians of the staff, city and from elsewhere, all of whom, with ourselves, thought recovery impossible. The clinical history would seem to point towards the peritonitis having been the seat of the initial disease, the consequence of which was hepatitis and disseminated pneumonia, the consolidation of which broke down and formed cavities.

J. D., male; aged 32; American; married; engineer; good habits; mother and two aunts died of phthisis. Patient was healthy until two years ago, when he took cold and was ill two months; has coughed since; has had three attacks of hæmoptysis, and three exacerbations of "inflammation of the lungs;" has been growing steadily worse since February; has had much cough, expectoration, and diarrhœa on and off.

Admitted April 18; very weak; cannot sit up all day; pulse, 122; temperature, 102.5°; respiration, 36; easily "loses breath" on slight exertion; bowels loose; abdomen tender; tongue red; throat sore; lips bluish: tubercle bacilli in large quantities in sputum, which is very "heavy."

Physical Signs.—Bronchial respiration and bronchophony, and dulness on percussion over upper left front to third rib, extending around to axillary region; also cavernous respiration, pectoriloquy, and mucous click, with bubbling râles behind; mucous râles and coarse respiration over upper right lung.

May 18.—Physical signs "dryer"; whispering pectoriloquy, however, over left lung.

Treatment.—Hypodermic injections of iodine (one-twelfth to one-third grain) daily; then gold and sodium. But bowels continuing loose, the gold was substituted, after a few days, for the iodine, atropine, chloranodyne, gallic acid, brandy, etc.

This advanced case showed considerable improvement, as marked by lowering of temperature, lessened diarrhœa, cough, and expectoration, with increase of strength and appetite.

Patient went home, on our recommendation, little, if any, better; heard in June that he was "holding his own;" have heard nothing since.

M. D., aged 19; female; American; no occupation; single; family history good; hygienic surroundings good; has coughed some ever since an attack of whooping-cough at eighteen months of age; been quite ill more or less for last two years; worse, with emaciation for last year, with more expectoration and cough, chills and fever; no menstruation for last year.

Admitted March 28; pale and thin; tongue coated; no dyspepsia or diarrhœa; no appetite; very nervous; pulse, 100; temperature, 99.8°; respiration, 22; feels weak; easily perspires; breath short; tubercle bacilli present in sputum.

Physical Signs.—Dulness on percussion; increased vocal fremitus and vocal resonance, and loud rasping respiration over upper half of right lung; at apex, large mucous râles; limited moist crackling at left apex; chest tender.

Treatment.—Hypodermic injections of iodine (one-twelfth to one-third grain) until April 7; then gold (one-tenth grain, increasing to one-fifth grain); was given bone-meal, whiskey; codeine and atropine at night, and quinine occasionally through the day.

This patient steadily improved, without

hinderance, excepting from the 5th to the 12th of May, when the temperature rose again; expectoration increased, and diarrhœa appeared. She grew better again, and most of the time during May the temperature was normal. The lung cleared up, so that when she left there was only heard on auscultation dry creaking râles. Patient reported last September as well, with only a little expectoration in morning. There were a few tubercle bacilli in the sputum, examined the latter part of June, however.

J. F., aged 29; American; clerk; married; family history good; was well until last September, when he had pneumonia; has coughed and expectorated ever since; hæmoptysis two weeks ago; soreness of throat and hoarseness on and off since; chills and fever lately; poor appetite; growing weaker.

Admitted March 23; emaciated some; pale; hoarse; considerable cough and expectoration; pulse, 98; temperature, 101°; respiration, 28; tubercle bacilli present.

Physical Signs.—Diminished fremitus; bronchial respiration and dulness on percussion over upper left lung to fourth rib; paddle-wheel respiration over upper right; no râles; swelling of arytenoids and slight erosion on left aryteno-epiglottic fold.

May 12.—Physical signs better; larynx looks very well, but hyperæmic.

Treatment.—Hypodermic injections of iodine (one-twelfth grain, increased to one-half grain) daily, and twice daily for two weeks; then gold (one-tenth grain, increasing to one-fifth); chlorine inhalations once daily; bone-meal and maltale; codeine for cough at night; also spray of menthol and creosote at night in throat.

Patient rapidly improved in every way until the 10th, when evening temperature rose to 102°, and next day 104°. On the fifth day diarrhœa occurred. The injections and inhalations were lessened, and on the 12th he grew better. Temperature gradually lowered, ranging between 98.5° and 100° until May 1, when he had an exacerbation for about five days. He left very much better, but still hoarse, and with a temperature above normal.

He left the hospital for his home very much improved. We learn that he grew better, so that he was about to enter a store, but at this time contracted acute pneumonia from a severe wetting, and died. This was in September, 1891.

H. H., aged 44; Canadian; widow; dressmaker; family history good; worked hard; lived in damp houses; never exposed to phthisis; was not strong, but quite well until February, 1891, when she "took cold;" early in March spat up some blood; expectoration has been streaked many times since with blood; has been growing worse the last two months; chills, fever, etc.; voice good; no nasal catarrh.

Admitted March 1; appears spare; says she lost considerable weight; bowels regular; poor appetite; feels weak; unable to work; pulse, 100; respiration, 26; temperature, 101.2°; night-sweating on and off, she says; considerable yellow-gray expectoration; tubercle bacilli present in sputum.

Physical Signs.—Prolonged and jerky expiration: dulness on percussion, and bronchophony over upper left lung; weak respiration below; no râles; broncho-vesicular respiration over the lower right lung.

Treatment.—Hypodermic injections of iodine (one-twelfth grain, increasing to one-third grain) every day; bone-meal; acetanilide at night; hypodermic injections of gold after ten days, with iodine (one-third grain), twice a week; morphine and codeine, acetanilide and sulphonal, as required.

Temperature ranged from March 1 to 9 between 99.5° (A.M.) to 101.6° and 102° (P.M.). From the 10th to the 13th it was normal or subnormal (A.M.). Thence, to her departure, it intermittingly lowered, ranging the last week between 98.5° and 100°, rising about every second evening. The lung "cleared up," showing only broncho-vesicular respiration. This patient was heard from in October as "being about" and able to work, although weak, with cough and expectoration in the morning.

No note of menstruation having returned; tubercle bacilli had disappeared from sputum.

J. W., aged 29; American; teamster; married; good family history; never exposed to phthisis; good hygienic surroundings; good habits; generally well, until three years ago "took a cold;" expectorated bloody sputum then, and on two occasions since; has coughed ever since; never had diarrhœa or dyspepsia; lately has grown weaker, with some fever and more expectoration (about two ounces in twenty-four hours.

Admitted March 4, 1891; not emaciated much; some appetite, he says; icteroid; pulse, 110; temperature, 103°; respiration, 30; pain in chest more or less, and feeling of heaviness; sputum yellowish gray; tubercle ba-

cilli numerous in sputum; able to "be up and around;" constipated.

Physical Signs.—Dulness on percussion; bronchial respiration; bronchophony, and increased fremitus over left back up to third rib; broncho-vesicular respiration on other side.

Physical signs showed improvement, and when he left the hospital (May 6) there was no bronchophony nor bronchial respiration, but creaky, wheezy sounds.

Treatment.—Hypodermic injections of gold (one-twentieth grain) were given twice daily, and chlorine inhalations twice a day; bone-meal and quinine through the day, and acetanilide or codeine at night. Milk was given freely or Mosquera's food; also inhalations of chloroform and ether for cough, if necessary. Hypodermic injections of iodine were given in one-half-grain doses from 10th to 20th of April.

Temperature ranged between 98° and 103° until the 8th, when it began to lower intermittently. From the 11th to 14th he vomited considerably and coughed hard; temperature rose again between the 10th and 20th of April; gold was substituted for the iodine, and chloranodyne given; temperature gradually fell again; cinchonidine and hydrastine was also given on and off. From April 21 to May 6 the evening temperature gradually fell (every other day higher,—about 100°); cough and expectoration much diminished. At last accounts (January, 1892) patient was quite well. He had not followed his vocation during the autumn and winter.

M. K., male; aged 27; American; clerk; single; father died of phthisis pulmonalis; other members of family healthy; good surroundings; habits had not been excellent; never had hæmoptysis; began feeling badly about September, 1890, and since then has rapidly grown weaker; much cough and expectoration, chills, fever, and sweating.

Admitted March 26; emaciated; very weak; bowels loose; tongue red; continual cough; pulse, 120; temperature, 102.2°; respiration, 30; tubercle bacilli in large number in sputum.

Physical signs show large excavation over upper right lung, and consolidation.

Treatment.—Hypodermic injections of iodine (one-twelfth grain, gradually increasing to one-third grain) daily; cinchonine, bone-meal, acetanilide, tannic acid, and quinine were given as required. We had no hope of beneficial results from any plan of treatment. It was found that whenever the iodine was increased to one-third grain the temperature would rise, and then subside for a period of about two days; no effect on temperature was observed from injections of gold.

We learn that this patient died in June.

Mrs. M. H., aged 28; American; married; family history good; good surroundings; was well until six months ago, when she had bronchitis; recovered from it, and then had "good health" for a year.

Five years ago was very ill again, probably with pneumonia; recovered partially; but has not since been so well; has coughed ever since. One year ago was taken with hoarseness, and has been failing since; had one hæmoptysis nine months ago; went to Colorado last autumn, and came thence here; has been sleepless; has had fever, chills, and night-sweating.

Admitted March 31; thin; pale; poor appetite; considerable expectoration; pain in chest; constipation; coated tongue; pulse, 100; respiration, 20; temperature, 100°; voice all right; sputum thick, and teeming with tubercle bacilli.

Physical Signs.—Mucous râles; bronchial respiration; bronchophony and dulness on percussion over upper left front and back; prolonged expiration, and creaking over upper right front and back; high-pitched tubular respiration over left apex behind. On May 2 there were no râles, but some creaking over apices on forced respiration.

Treatment.—Hypodermic injections of iodine (one-twelfth grain) every night; inhalations of chlorine twice a day, from ten to twenty minutes at each sitting; bone-meal, maltale, milk, Mosquera's food; house tonic before dinner, and hot water before breakfast.

The temperature increased for three days, then gradually lowered. The iodine was increased to one-third grain daily; patient never showed iodinism; no hypodermic injections of gold were given; appetite improved right along; cough and expectoration grew less.

April 27.—Emulsion of eulachon oil was administered three times a day, instead of bone-meal.

May 3.—There was very little cough in morning, with expectoration of about one drachm; no tubercle bacilli in sputum.

Patient returned to her home in Cleveland. Heard from this patient January 15, 1892. She wrote that she was "*perfectly well*," excepting being short of breath; no cough.

(To be concluded.)

AN EXPERIMENTAL STUDY OF CERTAIN ACTIONS OF STRYCHNINE IN EXCITANT AND PARALYTIC DOSES.

By Edward T. Reichert, M.D.,* Philadelphia, Pa.

(Continued from page 156.)

THE CONVULSANT PERIOD.—The decided alterations which occur in the pulse-rate and arterial pressure coincidently with the onset of convulsions have already been noted, and, as suggested, although these phenomena are associated under ordinary circumstances, and seem, to some extent at least, mutually dependent, investigation shows that their simultaneous occurrence is accidental. That the motor disturbances do not constitute a necessary or important factor in the circulatory alterations is apparent in the fact of the presence of the latter in animals paralyzed with curare; and that the pulse and pressure effects are essentially independent of each other, is evident in the fact that while the pressure invariably rises the pulse-rate may at the same time be increased or decreased, and in the absence of definite relations in their fluctuations. Richter, Mayer, and Schlesinger noted that an increase in the pulse-rate accompanied the rise of pressure; Klapp found that there was always a diminution; and the experiments of Denys, as well as my own, prove that there may be an increase or a decrease. In Experiments 1, 3, and 4 there was an increase in the pulse with the rise of pressure; and in Experiments 2 and 7, for instance, a decided diminution.

Mayer states that, while an increase in the pulse is thus observed in normal animals, it does not occur after curarization; but that this statement is not true is proven by the investigations of both Denys and myself. In Experiment 5, on a curarized dog, the pulse-rate and pressure reached their maxima at the same time, the former passing from 111 to 248 per minute, and the latter from 126 to 224 millimetres. Even after doses far in excess of the lethal amount, similar effects on pulse and pressure are noted, as is apparent in the records of Experiments 8 and 9.

In Experiment 8 the maxima of pulse and pressure were noted at two minutes and forty-seven seconds, the pulse rising from 150 to 228 per minute, and the pressure from 32 to 204 millimetres. In Experiment 9 the most frequent pulse was recorded at the twentieth minute, and the maximum pressure at the fifth minute, although at the time of the greatest pulse-rate the pressure was but 6 millimetres less than the maximum, and had risen from 58 to 220 millimetres. These two experiments possess other features of interest, to which we will recur.

It is thus obvious that the increase of pressure is not necessarily related to definite changes in the pulse-rate; and that the rise in the pulse, commonly noted in normal animals, may also occur in those curarized.

After the tetanic paroxysm, with the accompanying rise of pressure and change in the pulse, the pressure gradually falls, and is attended with a progressive slowing of the pulse-rate, with higher pulse-curves; and death results from respiratory failure or general exhaustion. Should, however, artificial respiration be practised, the pulse and pressure sink below the normal standard (Denys), and gradually return to the normal, when a second dose may cause similar changes. After repeated or excessive doses, the pulse and pressure are invariably diminished.

From these investigations it is apparent that the important and typical effects during the preconvulsant period are a decrease in the pulse-rate, with higher pulse-curves, and a diminution of arterial pressure; that during the period of convulsions the pulse-rate is usually greatly increased, with lower pulse-curves, but may be diminished, while the pressure is decidedly increased; and that, after the period of active convulsions, the pressure sinks to the normal standard, and continues declining, while the pulse returns to the normal, going up or down, as the case may be; finally, they both fail, and death occurs, unless artificial respiration is used, under which circumstances both gradually recover.

There can be no doubt from these results that strychnine exerts a number of important independent actions on the circulatory apparatus, and that the effects on pulse and pressure depend upon affections of different parts. We may, therefore, first seek the actions involved in the alterations in the pulse, and then those concerned in the mutations of pressure.

During the preconvulsant period the common association of the slower pulse-rate with a diminution of pressure leads at once to the suggestion that they result from a stimulation of the cardio-inhibitory apparatus; and this

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receives support in the investigations of Mayer, who states that, after section of the vagi, no decrement of the pulse-rate is observed. Klapp, on the other hand, asserts by Steiner,* Klapp, and others in the cut-out heart of the frog.

The results of my own experiments seem very conclusive in explaining the cause of the

Experiment 8.—Dog; weight, 14.738 kilos. *Curarized.*

Time. min. sec.	Dose. gramme.	Pulse per min.	Pressure. mm.	Remarks.
.00		150	32	
.14	.009	150	32	
1.00				
.42				
2.30	.....	222	168	
.47	.....	228	204	Maximum pressure and pulse.
3.00	.....	156	160	
8.00	.....	162	142	
13.00	.....	192	160	
25.00	.....	198	168	
30.00	.005	192	162	
.29				
31.00	.....	180	132	
33.00	.....	156	98	
36.00	.....	180	144	
40.00	.005	180	156	
.22				
41.00	.....	162	116	
44.00	.....	164	110	
54.00	.....	174	136	
60.00	.01	174	128	
.46				
61.00	.....	148	84	
64.00	.....	148	68	
69.00	.....	168	104	
80.00	.02	174	128	
.57				
82.00	.....	66	44	Slow, strong heart-beats. During the following twenty minutes .05 gramme was injected at intervals, with the effect of gradually lowering the pressure and inducing slow, strong heart-beats. When asphyxia was caused, the pressure fell steadily.

Experiment 9.—Dog; weight, 4.988 kilos. *Curarized.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Remarks.
.00	.01	96	58	
.17				
.30	.....	102	74	
1.00	.....	104	130	Pulse-curves much higher.
3.00	.....	140	200	
5.00	.....	156	226	
10.00	.....	156	220	
20.00	.01	180	220	With the increase of the pulse, the curves became lower.
.20				
.30	.....	114	190	Pulse-curves higher.
21.00	.....	67	84	
30.00	.01	99	156	The last injection caused an immediate fall of pressure, with slow, very full pulse-curves.
.14				

that the diminution of the pulse-rate is constant, not only after section of the vagi, but after the entire isolation of the heart from the nerve-centres, and even after the intracardiac inhibitory ganglion has been paralyzed with atropine. The same result has been noted

diminution of the pulse-rate during this period. In three experiments in which the vagi only were cut, and in five in which the vagi

* Du Bois-Reymond, *Archiv f. Physiologie*, 1874, s. 474.

Experiment 10.—Dog; weight, 14.9 kilos. *Vagi cut.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Respiration per min.	Remarks.
.00 .34	.0005	156	112	5	Found minimum current, which, when applied to the peripheral end of the right vagus, would slightly inhibit the heart's action.
1.30	.....	150	110	5	
5.00	.....	153	84	5	
10.00	.....	148	93	6	
15.00	.....	144	98	6	Same current applied to right vagus causes stronger inhibition.
30.00 .50	.001	156	100	5	
31.00	.....	150	86	5	
32.00	.....	.....	.....	...	Convulsive movements; reflex excitability greatly increased.
37.00	.....	156	106	...	
50.00	.....	144	102	4	
62.00 .12	.04	140 215	102 242	4 ...	Tetanus. Respirations increased.
63.20	.....	99	12	...	A very strong current applied to the peripheral end of right vagus failed to inhibit the heart.

Experiment 11.—Dog; weight, 5.442 kilos. *Vagi cut.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Respiration per min.	Remarks.
.00 .43	.0003	222	148	5	Found minimum current to cause inhibition, as in previous experiment.
1.30	.....	228	144	5	
5.00	.....	242	160	5	Slight struggling.
13.00	.....	242	176	6	
15.00	.....	242	176	5	Peripheral vagi less excitable.
20.00	.....	234	182	4	
30 00	.....	234	166	6	
45.00 .33	.0003	222	130	6	
47.00	.....	234	128	8	Reflex excitability greatly increased.
52.00	.....	216	112	8	Convulsive struggles occur with each expiratory movement.
58.00 .30	.0003	216	100	8	
60.00	.....	186	98	7	
75.00 .40	.0003	204	90	6	
77.00	.....	216	86	5	
85.00 .52	.0006	216	76	7	
90.00	.....	210	99	7	
110.00 .30 .32	.015	204	74	6	Tetanus, during which there was a slight increase in pressure and pulse, followed by a fall in both. Respirations increased.
111 40	.....	.....	...	...	Death from respiratory failure.

Experiment 12.—Dog; weight, 28 kilos. *Vagi cut; curarized.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Remarks.
.00 .42	.01	181	144	Pulse-curves 2½ millimetres high.
1.00	...	81	302	Pulse-curves 32 millimetres high.
2.00	...	60	214	Pulse-curves 85 millimetres high.
5 00	...	91	204	Pulse-curves 14 millimetres high.
10.00 .18	.08	108	220	Pulse-curves 14 millimetres high.
.30	...	78	170	Pulse-curves 16 millimetres high.
15.00	...	69	112	Pulse-curves 16 millimetres high. Artificial respiration was stopped; the pressure began to fall, and continued decreasing until the heart ceased beating.

and upper cervical portion of the spinal cord were severed, the decrease was an almost constant effect. But the decrement during this stage must not be confounded with that which occurs late in the poisoning, or after excessive doses, which is of different origin.

In Experiment 10 the first dose was only about one-sixth of the fatal quantity. The alterations in pulse and pressure are essentially identical with those obtained in normal animals. After a second dose, twice as large, similar effects ensued; and after a third dose,

Experiment 13.—Dog; weight, —— kilos. *Vagi and spinal cord cut.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Remarks.
.00 } .40 }	.0005	120	54	Found weakest current when applied to right peripheral vagus would cause slight inhibitions.
1.00	.....	114	54	
2.00	.....	114	54	
3.00	.....	111	54	
5.00	.....	99	52	Vagi more excitable to electrical stimulus.
13.00	.....	108	54	
20.00	.....	112	54	
25.00 } .43 }	.005	117	54	
26.00	.....	117	54	
27.08	.....	136	...	Tetanic contractions.
28.00	.....	156	26	Vagi less excitable than normal.
33.00 } .20 } 34.13 }	.02	144	38	Pulse-curves much higher. Tetanus, accompanied with a very slight rise of pressure and a slower pulse.
35.00	.....	80	18	Very strong current applied to right vagus is unable to cause any inhibition; on the other hand, the pulse is increased to 87.
40.00	.....	99	22	Repeated the last observation; pulse increased to 102. Asphyxia was now produced, and was accompanied by a fall of pressure.

Experiment 14.—Dog; weight, 9.514 kilos. *Vagi and spinal cord cut.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Remarks.
.00 } .56 }	.0004	{ 132 { 126	81 } 78 }	Vagus responds to weaker stimulus than normal.
2.00	.....	126	77	
3.00 } 4.20 }	.0015	126	76	
.40	.....	.....	...	Tetanus, accompanied by a fall of pressure and a more frequent pulse.
5.00	.....	162	63	
6.00	.....	135	14	Vagus does not respond to stronger current. Asphyxia, accompanied by a steady fall of pressure.

Experiment 15.—Dog; weight, 6.803 kilos. *Vagi and spinal cord cut; curarized.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Remarks.
.00 } .38 }	.0005	{ 120 { 117	56 } 62 }	Found weakest current when applied to right vagus that would cause a slowing of the heart's action.
2.00	.....	112	58	Vagus more excitable.
7.00	.....	102	48	
15.00	.....	96	50	Vagus more excitable.
30.00 } .40 }	.0005	96	50	Vagus more excitable.
31.00	.....	99	50	
35.00	.....	99	68	
55.00 } .37 }	.0005	123	70	
56.00	.....	106	72	Pulse-curves higher; vagus far less excitable than normally.
60.00	.....	99	66	
80.00	.....	99	66	Asphyxia, accompanied by a steady fall of pressure.

tetanus followed, the pulse was greatly increased, and the pressure rose. Pulse and pressure then rapidly fell, and death occurred.

In Experiment 11 the doses were relatively larger. The pulse was slightly increased during the first fifteen minutes, and then a little diminished. Similar alterations were noted in pressure. Repeated injections brought down both pulse and pressure.

In Experiment 12 the dog was curarized

part of these experiments are different, are typical in character, and represent three distinct phases of the drug's action. In Experiment 10 the pulse was decreased in frequency, and it will be observed by the column of remarks that during this time the peripheral ends of the vagi were distinctly stimulated. This action has been abundantly confirmed in other observations (see Experiments 13, 14, 15, and 17). The slower pulse-rate is, therefore, obviously due to the stimulation of

Experiment 16.—Dog; weight, 20.914 kilos. *Vagi and spinal cord cut; curarized.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Remarks.
.00 } 1.03 }	.0008	198	30	
3.00	.....	198	30	
5.00	.....	198	30	
10.00 } .42 }	.0008	195	32	
12.00	.....	195	35	
22.00 } 23.20 }	.004	190	36	
25.00	.....	190	36	
35.00	.....	174	36	
40.00 } 65.00 }	.027	174	30	This quantity was injected in divided doses, and without other effect than a gradual decrease in the pulse-rate, with increased height of the curves. Asphyxia, accompanied by a steady fall of pressure.

Experiment 17.—Dog; weight, 18.14 kilos. *Vagi and spinal cord cut; curarized.*

Time. min. sec.	Dose. grammes.	Pulse per min.	Pressure. mm.	Remarks.
.00 } 1.54 }	.05	147	24	Found weakest current to cause reaction in vagus.
1.30	...	103	26	
5.00 } .40 }	.04	90	28	Pulse-curves higher; vagus less excitable than normal.
6.00	...	90	30	
10.00 } .29 }	.05	90	26	
12.00	...	84	26	
17.00 } 68.00 }	.70	86	24	During this interval this quantity of strychnine was injected in divided doses; at the end the pressure was 26 millimetres and the pulse 102, with high curves. No noticeable change in pressure occurred at any time during the experiment.

in order that large doses might be used. The pulse was greatly decreased in frequency with increased force, the height of the curves increased from 2.5 millimetres to 85 millimetres within two minutes. The blood-pressure at the same time was enormously increased, passing from 144 to 302 millimetres. Throughout the entire experiment the heart's beat was slow and full, and the pressure was far in excess of the normal until after the second injection, when it slowly fell.

The effects on the pulse-rate in the early

the cardio-inhibitory peripheries. In Experiment 11 the pulse was increased. This effect represents a depression of the cardio-inhibitory apparatus,—first, because a marked increase seldom occurs after section of the vagi; second, when it does occur under such circumstances, and is at all distinct, the vagi peripheries are less excitable to electrical stimulus than normally. In Experiment 12 the pulse-rate was greatly reduced throughout. The origin of this is entirely different. It is not due to stimulation of the cardio-inhibitory peripheries, as is proven by the

fact that, after such large doses, the vagi are greatly depressed, if not completely paralyzed. Heinemann,* Mayer, and Klapp each affirms that the peripheral portions of the vagi are not paralyzed, but Martin Magron and Buisson, as a uniform result of a large number of experiments, found that these parts, sooner or later, lost their irritability. The results of my own experiments in this respect are so uniform and positive that no question can remain of their accuracy. The discrepancy in the conclusions arrived at in the various investigations referred to I have found to be due largely to differences in dosage and to the varying lengths of time the animals were under observation. This depressant action on the cardio-inhibitory apparatus will be referred to more fully in Part II.

That the slow pulse-rate in this experiment is dependent upon a direct action on the heart is evident in the fact that, after similar doses, it occurs after the heart has been isolated from the nerve-centres by section of the vagi and upper cervical portion of the spinal cord (see Experiment 17). This I have repeatedly verified. The part of the heart thus affected has been rendered evident by the experiments of Steiner, and later by Klapp. They found that when the poison was directly applied to the heart of the frog, the beats became less and less frequent, and that when only limited areas were poisoned, the effects were greater when the application was made to the sinus venosus. They were, therefore, justified in the conclusion that the excito-motor ganglion was the essential part to suffer, this being depressed, and thus causing slower beats; but the automatic motor ganglion must also be affected, because, when the poison was placed on the auriculo-ventricular groove, the beat became slower.

I have not been able to find evidence to indicate that any action is exerted on the accelerator apparatus of the heart, or on the heart-muscle itself, unless on the latter after enormous doses.

These three experiments offer illustrations of three consecutive phases of the actions of strychnine on the mechanism concerned in the production of the pulse, all of which may be shown in a single experiment. A critical examination of the records of Experiment 5 will elicit four distinct effects,—first, a transient increase; second, a diminution, lasting until the second dose; third, a marked increase, especially decided after the third dose; and fourth, a marked decrease following the last injection. The primary increase, which is not always observed, and in any case only after intravenous doses, seems to be due to a sudden but transient overwhelming of the cardio-inhibitory apparatus; such, for instance, as is frequently observed in the case of the heart after the intravenous injection of small doses of a cardiac depressant, when a transient fall of pressure ensues, followed by rapid recovery. The primary decrease in the pulse, which must be looked upon as representing the important action of small doses, is due to a slight stimulation of the same apparatus. The increase in the pulse which then occurs, which is usually particularly marked at the onset of convulsions, is due to a depression of the same parts. Finally, the slow pulse, representing the last phase, is due to a depression, chiefly of the excito-motor ganglion of the heart. With the exception of the primary increase, these effects represent progressive stages of the toxic actions. It is, therefore, obvious that the size of the dose and the individual susceptibilily of the animal will determine the nature of the result; moreover, since different parts are involved in these alterations, the actions may not be apparent in regular sequence, but overlap, as it were, thus more or less modifying the results.

The typical and important effects and actions during the stage of excitement are, a primary decrease in the frequency of the pulse, due to a stimulation of the cardio-inhibitory apparatus; then an increase, due to a depression of the same; finally, a decrease, due chiefly to a depression of the excito-motor ganglion in the heart.

The Arterial Pressure.—We have to consider, as with the pulse, the typical effects occurring during the three periods of the stage of excitement.

During the preconvulsant period, in a vast majority of cases, there is a fall of pressure, which is accompanied by a less frequent pulse, with higher curves. This association suggests, as already mentioned, that the former is dependent upon the latter, but that such is not the explanation is certain in the fact that after section of the spinal cord in the upper cervical region, by which the vaso-motor centres in the medulla oblongata are functionally destroyed, the same slowing of the pulse-rate is still observed, but no fall of pressure. It is, therefore, obvious that the vaso-motor centres are in some way account-

* *Virchow's Archiv*, Bd. xxiii., s. 394.

able for this change. Whatever may be the nature of this action, which I have not been able to determine, it is entirely set aside by curare, the pressure in animals thus previously paralyzed rising at once, although the typical decline in the pulse is present (see Experiment 5). In some cases during this preconvulsant period the pressure suffers no appreciable change (as in Experiment 1). With the appearance of tetanus, or the second period, the pressure is always notably increased, sometimes to a remarkable extent. This is immediately followed by a decline, so that the normal is reached within from one to four minutes; and, if the convulsion has not proven fatal, the pressure sinks far below the normal, and gradually recovers, or continues sinking until death occurs. Should artificial respiration be practised after the first convulsion, the pressure recovers, and if the first dose was not excessive, a second dose will cause a repetition of the first effects, but after a time repeated doses will lower the pressure, instead of increasing it. That the convulsions are not accountable for the rise of pressure is proven by the occurrence of the latter in curarized animals. It is an interesting fact, first noted by Denys, and confirmed by my experiments, that the rise of pressure in curarized animals is greater, relatively and absolutely, than in normal animals, and of much longer duration. For instance, in five experiments by Denys, on normal rabbits, the mean maximum point attained was 198 millimetres, while on two which were curarized the mean was 208 millimetres. In the first set the pressure sank so rapidly that the normal was reached in from one to four minutes; but in the latter the normal was not regained until forty-nine and nineteen minutes respectively. Strychnine does not stand alone in its power of thus exerting a more intense action on the pressure in curarized animals, for I have noted the same phenomenon with nicotine and various salts of ammonia.

The action of strychnine to cause this rise of pressure is yet a matter of dispute. That it is essentially independent of any alterations in the heart-beat is evident in the fact of its occurrence whether the pulse-rate is increased or diminished, although it may be affected favorably or otherwise in this way. By comparing the pulse and pressure records in Experiment 8 or 9, it will be noted that the changes are closely associated and suggest a dependency, but a similar comparison in Experiment 2 or 12 will show that the rise of pressure was attended with a great diminution in the pulse rate. That the heart is not the factor is admitted, the point in dispute being the part of the vaso motor system directly affected.

There should be no difficulty in determining this, and, with the exception of the results obtained by Schlesinger, the conclusions of all investigators are in accord. Both Richter and Mayer have seen the arterioles contract after giving strychnine. The sole question is, whether the action causing this is peripheral or central. That it is not peripheral is shown in the absence of contraction in the vessel-walls after section of their efferent nerves. Mayer and Klapp found that no rise of pressure occurred after the section of the spinal cord, but Schlesinger asserts that, after such operation, the rise was greater than in the normal animal.

To determine this point the following five experiments were made, in each of which the vagi and upper cervical portion of the spinal cord were cut. In every instance careful autopsies demonstrated that the sections were complete.

The results of the above five experiments are so uniform and positive, and being in accord with those obtained by Mayer and Klapp, doubt can no longer exist that strychnine is unable to cause an appreciable rise of pressure after section of the spinal cord in the upper cervical region. The increase of pressure is, therefore, due to a stimulation of the vaso-motor centres in the medulla oblongata. The opposite results obtained by Schlesinger seem undoubtedly owing to the fact that his sections of the cord were not complete. Klapp and myself both have found that if even a few fibres are left intact the characteristic rise of pressure occurs. This I noticed in three experiments.

This stimulant action on the vaso-motor centres is followed by one of depression. This latter is manifest after repeated doses (as in Experiments 8 and 9), or after single very large doses, as will be shown in the records of experiments in Part II. After section of the spinal cord, no fall of pressure is observed until the heart becomes impaired. But this will be more fully considered later.

The increase of pressure is due to a stimulation of the vaso-motor centres in the medulla oblongata; and the fall to their depression, which is preceded and assisted by a depression of the heart.

(To be continued.)

THE PATHOLOGY AND TREATMENT OF TETANUS, INCLUDING A SERIES OF INVESTIGATIONS IN REGARD TO THE MICRO-ORGANISM OF THE DISEASE AND THE INFLUENCE OF DISINFECTANT SUBSTANCES ON THE SAME.

A STUDY FROM THE PATHOLOGICAL LABORATORY OF THE JEFFERSON MEDICAL COLLEGE.

By D. Braden Kyle, M.D.*

(Concluded from page 171.)

TREATMENT.—The disease being an infectious one, isolation of the patient is of great importance. As the wound is the seat of inoculation, thorough antiseptic measures must be employed. As a prophylactic precaution, all irritating substances must be removed. If the wound be closed, it should be freely incised, disinfected, and free drainage established. In the case reported, pure bromine was applied, with undoubted beneficial results. Too much importance cannot be attached to the nourishment of the patient, whose diet should be entirely of a liquid nature. If this be impossible by the mouth, then nutrient rectal enemata must be employed. The bowels must be kept open, under no conditions allowing thirty-six hours to pass without an evacuation.

The patient should be kept quiet in a darkened room, preferably by himself, and no one allowed in the room except the attendant. The room should be well ventilated, but no current of air should be allowed to strike on the patient, as even slight draught will suffice to produce a paroxysm.

The remedies which have been most successful are those which lessen the reflex function of the spinal cord, the most successful of these being the bromides and chloral, both given in decided doses, until their full physiological effect is produced. Thirty grains of chloral should be used, with sixty grains of the bromide of potassium or sodium, and in two hours, if necessary, thirty grains more of the bromide may be administered. If the drugs are vomited, they should be given by the rectum, and, if necessary, the patient may be chloroformed until they are absorbed. Different remedies have been used with varied success, such as conium, atropine, nicotine, wine of tobacco, physostigmine, eserine, chloroform, alkaline baths, and hypodermic injections of carbolic acid.

Chloral and the bromides have undoubtedly the most marked influence upon the severity of the spasms. For the relief of the paroxysms, much can be done by application of cold to the spine.

Professor H. A. Hare, in his essay on "The Physiological and Pathological Effects of the Use of Tobacco," cites nineteen cases treated with tobacco, of which nine recovered. The drug was used in the form of fomentations, injections, and cataplasms, or given internally, nicotina, in doses of from $\frac{1}{12}$ to $\frac{1}{6}$ drop, or nicotine, in doses from $\frac{1}{2}$ to 3 drops every few hours.

Miller recommends cannabis indica pushed to narcotism.

Elliston highly recommends some preparation of iron, preferably the carbonate, in chronic cases.

Topez reports a case successfully treated with injections of morphine and cocaine, each five per cent. solution. Billroth strongly recommends narcotics, especially morphine and chloroform, also warm potassium baths, strong irritants to spine, large blisters, and the hot iron.

Treves recommends the use of chloral, in 15- to 20-grain doses, at onset of the disease, followed by bromide of potassium. He also suggests the use of cocaine to control reflex action. Brunauer's case of rheumatismal (?) tetanus, which he reports cured by pilocarpine, was also given chloral hydrate.

Moullin recommends, above all other remedies, chloral and potassium bromide. He also urges the necessity of keeping up nutrition and of keeping the bowels open.

Potter, in his article on "Special Therapeutics," in which he enumerates some twenty different remedies, shows the best results from chloral, combined with the bromides. Shaw and Tordeus each report a case cured by combined doses of chloral and potassium bromide. In both cases this was continued one month before a cure was effected.

Ore, of Bordeaux, cites one case where intravenous injections of chloral, after one or two repetitions, entirely relieved the paroxysms. Chopard, in his thesis on tetanus, enumerates one hundred and thirty-two cases treated with chloral hydrate, with sixty-nine cures. Tabbi, in 1871, thirty-two cases, with fourteen cured. Beck, one year later, recorded thirty-six cases, with twenty-one cured. Knechl, in 1878, one hundred and thirty-four cases, with seventy-nine cured.

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Professor W. S. Forbes reports a case of traumatic tetanus cured by the continued use of amyl nitrite.

Hansen reports two cases successfully treated by morphine and amyl nitrite. Richardson, three successfully treated by amyl nitrite alone.

Coste, of Marseilles, successfully treated one case with sulphate of quinine.

Bright cites one case in which quinine afforded permanent relief.

Navarro, in 1869, reported seventeen cases treated with eserine, with success in twelve cases.

Of cases successfully treated by curare, Chassaignac, in 1854, reports one case; Wells, two, with one cure; Demme, twenty-two cases, with eight recoveries; Busch, eleven cases, with five recoveries.

Capozzi, Morra, and Gherini each report one case cured by curare.

Eilert, Halhouse, Wilkis, Wood, and Watson report one case each in which calabar bean effected permanent relief; while Ashdown, Spencer, and Dickerson had no success from the use of the drug.

Hunter was successful in two cases by using chloral and cannabis indica.

Delsae saved three out of four cases by opium and chloral; Wood, nine out of eighteen by chloral alone; Birkett, one case; Page and Morgan report one cured case each, treated by aconite. Franzolini reports one case cured after twenty-nine days' treatment, during which time four ounces of chloral and twenty-two grains of hydrochlorate of morphine were administered.

Johnston, of Baltimore, successfully treated several cases by means of hypodermic injections of conine.

Mattingly's traumatic case, following a crush of the finger, was relieved by amputation. Frederick, in 1837, reported two hundred cases in which amputation was resorted to, with twenty-four recoveries. Curling, in 1835, reported seven recoveries out of eleven amputations; Paland, two cases, with one recovery; Yandell, seventeen cases, with ten recoveries; Early, in 1871, one case, with recovery.

Bartholow recommends excision of the cicatrix.

Buck reports one case in which dissecting out the scar afforded almost immediate relief.

Farrey, in two cases, divided the tissues forming the floor of wounds, followed by rapid disappearance of the tetanic symptoms.

Samuel Wood, in a case following compound fracture of the femur, divided the saphenous nerve, and the operation was followed by recovery.

Watson reports sixteen cases in which neurotomy was performed, ten of which recovered. Farrey and Murray's cases were entirely relieved by division of the injured nerve.

Base and Marinelli divided the musculocutaneous nerve for tetanus, following a gunshot wound of arm, and the patient recovered.

Edwards records an instance of recovery following the division of the short saphenous nerve, the original injury being a lacerated wound of heel, followed by sloughing.

Fayer's case, following a lacerated wound of the hand, was relieved by division of the median nerve.

The treatment of traumatic tetanus by means of injections of the tetanus antitoxin of Tizzoni and Cattani by Dr. Rudolf Schwarz, assistant in the surgical clinic of Padua, is discussed in the *British Medical Journal* of January 2, 1892.

Tizzoni and Cattani claim to have succeeded in producing immunity against tetanus, even in animals susceptible in a high degree, and have shown that the blood serum exerts an antitoxic action, and is capable of producing immunity. The tetanus antitoxin is obtained in a solid state by the addition of alcohol to the serum, and by drying the precipitate *in vacuo*.

The antitoxin was used hypodermically, in doses of 15 to 25 centigrammes. Thus far four cases have been reported as treated with the antitoxin,—one by Gagliardi, of Molinella; one case by Dr. Pacini, in the hospital at Colle di Val d'Elsa, Tuscany; one by Professor Nicoladoni, in the surgical clinic of Innsbrück; and the fourth by Dr. Schwarz. The latter case was also treated by chloral, warm baths, injections of carbolic acid, and by division of the nerve.

The general treatment may be summed up as follows:

1. Disinfection of the nidus of development of the bacilli.

2. The elimination of the poisonous products of the bacilli from the system.

3. Drugs which are sedatives to the nervous system.

4. Excision of the cicatrix.

SPINAL ANÆMIA DUE TO SYPHILIS.

By Orville Horwitz, M.D.*

As our knowledge of this affection is to a great extent of recent date, beginning, it is believed, with the monographs of Gross, Lancereaux, Layneau, and Zambaco, who, during the years 1860–61, first called the attention of the profession to syphilis of the nervous system, it is presumed that it will not be uninteresting to present to the reader such observations as I have been enabled to make, and the deductions that I have drawn, while having under my care six cases of the disease.

It is to be regretted that I can offer but little that is new respecting the pathology of this affection, for the reason that I was unable to obtain post-mortem examinations of those who died, save in one case; yet I trust that a study of these cases will demonstrate that much can be done besides following the usual specific treatment, which, I believe, in some stages of the disease, to be harmful, and to be avoided.

During the past nine years I have had under observation but six cases of spinal anæmia occasioned by syphilis, and as I have had an unusual opportunity for seeing large numbers of patients afflicted with all forms of venereal disease, it is natural to infer that it is not a common sequel to this disorder.

Of the six patients under observation, four were women. That spinal anæmia more frequently occurs in females than in males is well known, but why this law should apply to syphilitic subjects is not readily understood. The cause of the anæmic condition appears to be due to certain changes which take place in the coats of the artery supplying the cord. The question naturally arises whether these vessels are more predisposed to the changes referred to in the female than in the male. From the limited number of cases that came under observation, it would not be wise to infer that the disease really occurs more frequently in one sex than the other.

Syphilitic diseases of the nervous system are more apt to be developed in individuals of either an hereditary or acquired neuropathic constitution.

The patients were all addicted to the abuse of alcoholic stimuli; they all indulged in excessive sexual intercourse; all suffered more or less mental strain, and led very irregular lives; one was an opium-eater. It is not astonishing, then, that a nervous type of syphilis was developed in these cases.

The pathological condition can only be one of surmise, which is in a measure due to the fact that the symptoms are excessively slow in developing themselves, and that the disease is exceedingly chronic in its progress.

The patient will sometimes lie for years in a semi-paralyzed state, when the original cause of disease will be well-nigh lost sight of; the poor creature possibly dying of some intercurrent affection. During the long period that the sufferer has been under treatment he has necessarily been from time to time under the care of numerous physicians, the history of the case is lost, and there will be no one especially interested in it, when at last death ensues.

When a post-mortem examination is finally made, the spinal cord will most probably be overlooked, neglected, and not subjected to examination; that its careful investigation is attended with more difficulties than any other portion of the body will probably explain why its examination in the dead-room receives so little attention by the investigator.

Inflammation of the coats of arteries frequently follows as a result of syphilis; no part of the arterial system being exempt, and of course the most serious consequences must follow the involvement of the vessels of the brain and spinal cord.

The greatest danger to life is when the minute ramifications of the small vessels supplying the nervous system become involved; the canals of these arteries becoming almost, and, in some cases, completely occluded, thus cutting off the blood supply to the very centres of life.

As the calibres of the vessels dwindle, and the blood-supply becomes inadequate for the nourishment of the nervous substance, it, as a result, undergoes softening, which, when examined after death, is often erroneously ascribed to a syphilitic inflammatory condition of the cord or its membranes; whereas the changes in the cord are really due to anæmia, produced by the alterations that have taken place in the vessels of the pia mater, the real cause of mischief being overlooked.

A detail of the case about to be cursorily presented will serve as an illustration:

I. R., aged 40, retired merchant, married, gives the following history: He had a severe outbreak of syphilis when twenty-two years

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of age, for which he was under treatment for the space of ten months, when he was pronounced by his attending physician entirely cured. During the next few years, however, he had several attacks of tertiary syphilis, for which he underwent treatment by different physicians. He had been free from any manifestations of disease for two years previous to my first seeing him, when he began to suffer from pains in the back, legs, and arms of a dull, aching character, which were worse at night. Coincidently with the pains were progressive emaciation, loss of strength, and finally complete paralysis of the lower extremities. This was his condition one week before his death, when first seen by me. He died from marasmus.

Autopsy twelve hours after death.

Rigor mortis marked; great emaciation; large bed-sore on lower portion of back.

Contents of cranial, thoracic, and abdominal cavities normal.

The Cord.—The lower dorsal and upper portion of the cord was very soft and flattened. The gray matter was of a dark color. The pia mater, removed from about the diseased portion of the cord, appeared normal, but on subjecting it to the microscope, the vessels were seen to be enormously thickened, degenerated, and in parts completely occluded; others gave evidence of fatty degeneration.

The portion of the pia mater just above the softened portion of the cord showed evidence of inflammatory changes having taken place, such as occur in the earlier stages of the affection, and tallied exactly with the description given by Heubner of the changes that ensue in the cerebral arteries under the influence of syphilitic poisoning.

This case clearly proves that the alterations that occur in the pia mater cannot be observed without the aid of the microscope; for to the unaided eye the membranes looked entirely normal. Had a study of the membranes not been made, the changes would have been ascribed to a specific inflammation of the cord or its coverings.

How far changes in the vessels which supply the cord are the primary causes of many cases of spinal syphilis it is impossible to determine without more extended observation. I think, however, that it is much more frequently the starting-point of specific spinal trouble than has hitherto been suspected.

The microscopical study of the diseased pia mater may be divided into that portion of the membrane which lies immediately above or below the softened mass, and that portion which surrounds the diseased cord.

The difference between the two portions of the membrane was very marked; that removed from the healthy part of the cord showed the changes which occur in the acute stage of inflammation, whereas the other portion was in the condition usually associated with a part chronically inflamed.

The pathological alterations may be divided into the stage of congestion, that of acute inflammation, and if the process continues, into that of chronic inflammation.

The process is essentially very slow, continuing over a period of months, and even years, before the calibre of the vessels become so occluded that the nourishment to the cord is sufficiently interfered with to produce softening. In the specimen which showed the disease in its earlier form, it was found that the structure consisted almost entirely of a new cell-growth, which had not undergone organization to connective tissue.

In the second specimen, the embryonic tissue had become organized into fibrous connective tissue, and not only had the walls of the vessels become enormously hypertrophied, but the contraction of the new-formed connective tissue had in most cases almost, and in some cases completely, occluded the tube of the arteries.

The principal changes were found in the intima, while the external coat was nodular and thickened; the elastic coat was very slightly altered from its normal condition. It was somewhat wrinkled; probably due to the contraction of the newly-formed connective tissue.

It is probable that at first very few vessels are involved, hence the slow development of the symptoms; the inflammation, too, is not of an active type, even in the first stages. The changes in the structure of the arteries involved takes place very slowly, hence a long time is consumed before any secondary modifications take place in the cord. It, furthermore, shows that if a perfect cure is to accrue, it must be effected during the first stage, for after the arteries have become blocked, and the vascular supply to the cord permanently interfered with, the patient either becomes a hopeless paralytic or, what frequently happens, dies from exhaustion, if not from some intercurrent disease.

I am inclined to agree with Wyeth that the cause of syphilitic arteritis is the inflammatory poison, travelling in the line of the blood-current through the vasa vasorum, al-

though the direct irritation of the passage of the poisoned blood upon the endothelium, which Heubner believes to be the cause of the changes which take place in the vessels, may also act as a factor in lighting up the low grade of inflammation.

Of the six cases that came under observation, four belonged to the lowest walks of life; they were addicted to the abuse of alcoholic liquors and to all manner of excesses.

The disease does not appear to be developed until late in the tertiary stage of syphilis; the following gives the period of development in each case after the initial lesion: Three and a half years, four years, five years, seven years, eight years, and sixteen years.

The earliest symptom is a loss of desire for any mental effort, and should the patient attempt to use his brain, it usually results in a confusion of ideas, and he experiences a feeling of mental and physical exhaustion. He is tormented with insomnia, though at times the sleep is deep, heavy, and prolonged, from which condition he will wake up unrefreshed, and unable to make use of any mental or physical effort; as one of the victims expresses it, as "though he were a dead man."

The slightest emotional excitement, such as anger or apprehension, produces trembling of the limbs, especially of the hands, which shake as though the patient were suffering from paralysis agitans. When the excitement wears off, the hands continue to be unsteady.

Very soon an irritating twitching of certain muscles of the body is observed, especially those of the thighs, back, legs, and arms, beginning in the order named. The tensor vaginæ femoris, the quadriceps extensor femoris, and the muscles of the back were usually the first to become affected. This condition ordinarily obtained when the patient was in the recumbent posture. It was especially the case at night. It was absent or unobserved when the individual was sitting up, and when the mind was more or less diverted from his ailments; the twitchings appeared to be increased when lying on the back, and were modified or absent when resting on the side.

Excesses of any kind, whether over-indulgence in the use of tobacco, alcohol, or sexual intercourse, increased the nervous twitchings, and filled the mind of the patient with alarm.

The general feeling of discomfort is very distressing; it is usually accompanied by a sensation of fatigue in the lumbar region; at first this is noticed after unusual exertion or fatigue, but it soon becomes constant, and is readily brought about by violent and jolting exercise, such as riding over rough roads and the like.

This feeling of discomfort is greatly relieved by flexing the legs upon the thighs, and by placing a pillow under the back; and great comfort is experienced by resting on the side and drawing the knees up towards the abdomen.

Soon the patient begins to lose flesh, is weak, dispirited, irritable, and hysterical; limbs subject to alternations of feelings of heat and cold; face frequently becoming flushed without any apparent cause.

One patient exhibited a curious perversion of sensation; from being naturally very sensitive to cold, he passed to the other extreme, and suffered greatly from a feeling of oppressive heat, so that having had all his life to clothe himself in the heaviest underwear, he found that even the lightest gauze shirt in midwinter was oppressive.

The evolution of these symptoms seemed to occupy a period varying from six months to a year, and probably corresponded with the early changes that were taking place in the coats of the arteries of the pia mater; and is possibly due more to some disturbance in the circulatory apparatus than to a diminution in the calibre of the vessels supplying the cord.

The similarity of the symptoms of this stage of the disease to those observed in nervous prostration or spinal *neurasthenia* is readily noticed.

Case II. is typical as illustrating the symptoms of this disease. This person had been an inmate of the Venereal Ward of the Philadelphia Hospital on four previous occasions; had contracted syphilis eight years previous to her last admission; the tertiary symptoms were well developed a year and a half after the appearance of the initial lesion. She had been under treatment at irregular intervals. When the outbreak was slight, she was prescribed for at a dispensary; when more severe, she resorted to a hospital. In the intervals, she led a fast life and drank to excess.

She stated that two years previous to her last admission she noticed that she was losing strength, that she was easily fatigued, that she was beginning to suffer from hebetude, that she took little or no interest in

anything, that she felt a continual desire to sleep, and that she awakened unrefreshed, with a dull headache, usually located in the back part of her head. She began to experience what she described as a "weak back." She had a constant sense of fatigue, which, very slight at first, increased on exertion, until finally it was constantly present, and assumed the form of a dull, aching pain, which increased to such an extent that she could with difficulty retain the erect posture longer than half an hour at one time. The pain increased when she reclined on her back, and to obtain relief it was necessary to lie on her side, with her knees drawn up. She had lost flesh and strength, was pale, and suffered frequently from palpitation of the heart, produced by any trifling exertion, or any slight disturbing cause. She suffered from constipation; her menstruation was scanty, and frequently absent. Twitching of the muscles of the thigh and back began to annoy her; her hands became tremulous, and any agitation would so increase the shaking that she could with difficulty retain her hold on anything. She would frequently break out in profuse perspiration.

She had been under the care of numerous physicians, whose diagnoses widely differed, one giving it as his opinion that she was suffering from nervous prostration, others that her troubles were due to uterine disturbance, and others, again, that she was suffering from marasmus.

Deriving no benefit from the treatment to which she had been subjected, she applied for admission into the Philadelphia Hospital, and was received in the Venereal Ward, where she remained six months, when she was discharged at her own request, having gained thirty pounds in weight, her general health greatly improved. She returned to her life of dissipation.

The advance from the first to the second stage is so gradual that it is only by carefully comparing the condition of the patient from time to time that the observer comes to the conclusion that he is slowly and surely becoming worse. He now keeps his bed, or, if he sits up for an hour or so during the day, he is very much exhausted, and gladly returns to the recumbent position.

He is pale, anæmic, and wasted, has little or no appetite, and the food that he takes does not seem to nourish him. The pain, that has hitherto been present only at night, begins now to be felt during the day, until finally it is seldom or never absent; the administration of an anodyne becomes necessary to give repose.

There are periods of increased pain, though their accessions do not appear to be due to atmospheric changes. Instead of being confined to the back and limbs, it is now felt along the subcutaneous surfaces of the more exposed bones, as the radius, sternum, tibia, etc. There is no thickening of the periosteum, tenderness on touch, nor does there appear on examination to be any symptoms of inflammation.

The pain is described as dull and aching; there is often great difficulty in locating it; it does not follow the course of the large nerves. It seems to resemble the "bone pains" of early syphilis, but is much more severe.

The joints retain their normal condition.

The muscles respond naturally to electrical stimulation.

Temperature is normal; heart irritable; pulse increased in frequency, generally being about 100 per minute.

The urine is usually normal, though at times it is loaded with phosphates, a condition often found to exist in cases of spinal anæmia associated with atonic impotence.

The wasting, due somewhat to insomnia and loss of appetite, increases until, in the last stage, the patient is reduced to a skeleton, when death closes the scene.

The third case that came under my observation at the Philadelphia Hospital presented all the symptoms of the second stage of the disease, which have already been given.

She was a woman about 30 years of age, very anæmic, and wasted to the last degree, weighing not over ninety pounds. She had several unhealed rupial ulcers upon her legs and back, and a spot of superficial necrosis on her frontal bone.

She stated that her health had begun to fail about a year and a half previous to her admission to the hospital. She had lost her strength; had twitching of the muscles of the thighs; pain in the back, frequently so intense that she could with difficulty retain the erect posture; was hysterical and irritable. Her sense of fatigue was continuous even after awakening from a sound sleep. The pain in the bones of her legs and arms, and in her ribs was constant and, as she expressed it, "horrible." She suffered greatly from insomnia, which could only be relieved by giving her morphine in half-grain doses.

The temperature was normal; skin dry and cold; heart normal; pulse increased in

frequency; no appetite; tendency to constipation; was hysterical and irritable.

Keeps her bed, not having strength to sit up.

Eye-ground normal; urine loaded with phosphates.

She was removed from the hospital by her friends, when the further history of the case was lost.

Judging from the clinical history obtained from Case I., paralysis gradually supervened. In the case referred to, paralysis of sensation preceded loss of motion. The paralysis of the lower limbs was complete. Control over the sphincters was lost for some two months before the patient died, proceeding apparently from exhaustion.

At the outset the diagnosis must be made between this disease, incipient ataxia and incipient myelitis; and, later on, from paraplegia, due to lesion of the cord and its membranes.

In ataxia, lancinating pains, girdle pains, early disorders of vision, paresis of the ocular muscles, and exaggeration of galvanic excitability are prominent symptoms.

In incipient myelitis, the sudden appearances of vague neuralgia, paresis, and paralysis of the lower limbs, obliteration of sensibility in some regions, stiffness of the joints, and difficulty of movement of the body generally exist.

As the disease progresses, the symptoms between spinal anæmia of syphilis and those presented by ataxia and incipient myelitis differ so widely that there can be no doubt on the part of the observer which disease he is called upon to treat.

The treatment naturally divides itself into that to be pursued before any marked change has taken place in the calibre of the arteries, which may be denominated the first stage; the period when the changes in the blood-vessels have taken place, which is the second stage; and the period when paralysis has fairly set in, which is the third stage.

The first subject for consideration is diet; its method of administration; the character of food to be allowed; its quantity; and the intervals that should elapse between attempts at nourishment.

All those who make a specialty of treating diseases of the nervous system agree that in cases of malnutrition, the first and most important thing is to get the patient to assimilate a proper amount of easily-digested food. This is often found to be the most difficult part of the treatment.

From the first the patient should be placed upon a plan of forced feeding. As there is usually a loss of appetite, and, in many instances, even a disgust for food, accompanied by weak digestion, it will be necessary to feed him with small quantities of concentrated nutritious aliment. It should, as a rule, be entirely liquid. It should be administered every second hour during the day, and every third hour during the night.

This plan should be pursued for a period varying from six weeks to two months, when it may be hoped that the invalid will not only have gained in weight but in strength, and that he may likewise have recovered his normal appetite, and even have a craving for solid food.

Should the stomach rebel at the frequent repetitions of food, or at the quantity put into it, the intervals of repetition should be lengthened, until it is ascertained by actual experience how much nourishment the patient can assimilate. As the case goes on to improve, the intervals can be decreased and the amount of nourishment increased.

Milk is by far the best article that can be administered; but, to prevent the appetite becoming cloyed, good strong beef-soup should be alternated with the milk.

A quart of milk and a pint of beef-soup during the twenty-four hours is the minimum amount to be given. The quantity of milk should be gradually increased and the soup decreased, until the milk diet alone is used. The milk should be gradually increased in quantity, until from three to four quarts daily are consumed.

Should the milk be not readily assimilated, it will be rendered more acceptable to the stomach by adding four ounces of lime-water to every pint, shaking the mixture well; then adding the whites of two eggs; again shaking; then sweetening to the taste, and rendering palatable by the addition of a tablespoonful of sherry.

The diet may be varied by the use of "Mellin's Food" mixed with milk. A cup of cocoa, chocolate, or rocohout may be used as a substitute for the milk.

Pure vanilla ice-cream, made of arrow-root and cream, home made, if possible, may be allowed occasionally.

The juice of raw beef will be found to be a very agreeable dietetic change. It is prepared by taking a pound of lean beef, cutting it up, squeezing out the juice by means of a lemon-squeezer, adding a single clove, placing the cup containing the juice into a vessel of

hot water, and letting it remain until it becomes hot, before drinking.

Koumiss may be allowed, and, for a change, buttermilk may be given.

Nutrition being of the utmost importance in the depressed condition of the nervous system, the greatest attention is to be paid to diet, for, as soon as the general condition improves, there is a corresponding amelioration of the nervous symptoms.

The plan recommended should be persisted in until the patient has greatly gained in weight,—say ten pounds or more,—when there is usually a craving for solid food; but the change from fluid to solid food should be very gradual. Only very small quantities of the most easily digested substances should be at first allowed, gradually adding new articles to the diet-list as the case progresses. The patient's appetite may be stimulated by allowing such digestible material as is particularly fancied.

If the appetite falls off, and the patient begins to lose in weight, he must at once return to the method of forced feeding.

Care must be taken to prepare no article of diet in the sick-room, and when the meal is served, it should be made to look as appetizing as possible. Every article should be perfectly clean, and should be served as nicely as the circumstances of the individual will permit.

If possible, the patient should not be allowed to know of what his meal is to consist, nor when it is to be served.

Stimulation is not only necessary, but is usually indicated. As a rule, the sick person is already addicted to the use of ardent spirits, and their continuance is a necessity. From three to four ounces of whiskey during the twenty-four hours will be sufficient; and, as the patient goes on to become convalescent, the quantity should be reduced, until, finally, it may be discontinued long before he leaves the physician's hands.

The use of tobacco should be allowed only in minimum quantities, or, if possible, be discarded altogether. It is always injurious in depressed forms of nervous affections.

The previous history and the condition of the patient must be the guide to medication. Generally speaking, those who present themselves for treatment have already been saturated with mercury, and their stomachs have lost all tone, and the power of assimilation is very poor. Usually, when the case first presents itself, medicine does more harm than good, by taking away the little appetite that the patient has left and producing continued nausea.

When, however, the digestive apparatus is in fairly good condition, and an active course of treatment has not been pursued, or if even the patient has been under medication, there will generally be indications for the renewal of specific treatment, as syphilitic lesions in some form, such as rupial ulcers and the like, will be found to exist. The question then presented is, What is the best remedy, how and when shall it be used?

If the forced feeding for the first three weeks has been persevered in, and the digestion has improved therefrom, then specific treatment may begin.

But if the digestion has been weakened, either through over-medication or the abuse of alcoholic stimulants, good results may be hoped for from judicious fumigation, which may be resorted to daily for the space of ten minutes, after which the patient is to be wrapped in a blanket and put to bed, there to remain until perspiration entirely ceases. Should the perspiration produce exhaustion, the fumigation must be postponed to every other day.

Fumigation should be continued for the space of three weeks, when it should be discontinued and medication *per os* commenced. Should the stomach be in condition to bear internal treatment, the administration of iodide of potassium in small doses may be commenced. Five drops of the saturated solution well diluted, and taken after meals, may be administered. If the case progresses favorably, the dose should be increased to ten drops. If the iodide of potassium is not well borne, thirty drops of the aromatic spirit of ammonia should be added to each dose.

The iodides should be continued for the space of six months or thereabouts, when mercury, in tonic doses, should be prescribed, either in combination with the iodide or by itself. This should be persevered in for another period of six months. As a rule, after having used the iodide for the prescribed time, it is well to stop it and have recourse to mercury, resuming the iodide after an interval of one month. If the patient is found not to be losing weight, it is well to combine the iodide with the mercury.

The nerve tonics, such as strychnine and phosphorus, are especially indicated. Strychnine, administered hypodermically, $\frac{1}{10}$ grain, three times daily, is recommended. Later it may be given by the mouth, in combination

with such remedies as have a tendency to produce reconstructive metamorphoses.

Iron, though indicated, usually cannot be employed while the patient is weak and depressed, as it invariably produces headache, causes constipation, and deranges the digestion; but when marked improvement becomes manifest, then it is exceedingly beneficial.

Of all the numerous preparations of iron, ferrum redactum, or reduced iron, is preferred. It can be pleasantly administered by sprinkling together with it a little black pepper on a piece of well-buttered bread, when it will be eaten by the invalid without his being aware that he is taking medicine.

The bowels should be carefully regulated; a glycerin suppository, or an enema of warm water, will answer every purpose.

When the tongue becomes coated and the breath "heavy," a powder composed of calomel, gr. $\frac{1}{12}$; creosote, gtt. i; pepsine, gr. ii; sugar, gr. v, administered every two hours, and repeated until the calomel produces slight purgation, will usually suffice to restore the digestion and clear the tongue.

Care must be taken in the administration of hypnotics; their influence is but evanescent, the effect of the remedy soon wearing off, and augmented doses are rendered necessary. In fact, they may be considered as positively injurious; other methods of producing sleep, to be presently referred to, are considered preferable.

From the first the patient should be kept in bed, where he should remain until he has gained both in weight and strength, which will usually occupy a period of about six weeks.

At his usual hour for retiring, he should be thoroughly massaged, when he will in all probability drop into a natural sleep.

In the morning he should receive a warm bath, and then be returned to bed, placed between blankets, and thoroughly rubbed with a a mixture composed of liquid cosmoline, 3 parts; alcohol, 1 part; the rubbing persevered in until the alcohol is evaporated and the cosmoline, as far as possible, absorbed by the skin. The body should then be rubbed dry with a coarse towel.

It is of the utmost importance to keep the spine at perfect rest. With this object in view, a leather jacket, braced with wire, is to be fitted to the body, and worn unintermittingly (save when the patient is being bathed or massaged). A plaster-of-paris jacket may be substituted for that of leather when it is necessary to take expense into consideration. The jacket should be worn from three to four months.

In all cases of spinal anæmia, no matter from what cause, great benefit will be derived from suspension, practised as is done in cases of ataxia. At the first going off, it should be repeated every day, and continued for the space of thirty seconds. As the patient becomes accustomed to the suspension, the time should be gradually increased to five minutes, and should be employed daily.

The utmost gentleness must be observed both in elevating and in lowering the patient, so as not to twist, jerk, and jar the spine; and, when the treatment is concluded, he should be put to bed, and kept at rest for at least one hour. This treatment to be persevered in for a period of from four to five months.

In cases of spinal anæmia, associated with atonic impotence, applications of ice to the spine have given very gratifying results, especially when the invalid suffers greatly from pain in the lumbar region. In making the application, a spinal ice-bag is preferred, especially when there is great pain in the lumbar region. Its application should be graduated, using it at first not longer than twenty minutes, and gradually extending the time to one hour. At first the sensation is unpleasant, but in a short time the patient enjoys the feeling, and in some cases it has been found so grateful that he is with difficulty persuaded to discontinue its use.

A spray of cold water, squirted over the body while standing in the bath-tub, so that the benefit of a needle-bath may be received, is very beneficial: it should be used for the space of about three minutes, and applied, preferably, over the spine.

As the case goes on to improve, and the nervous symptoms are ameliorated, the leather jacket and the massage may be discarded, and in their stead the Swedish movement and gentle exercise with light dumb-bells substituted.

As soon as the patient is strong enough to stand the exercise, a daily walk in the fresh air should be directed, going no farther than a single square the first day, and gradually increasing the distance by adding at first but a block each day, until the patient can achieve three or four miles without discomfort. Much good will result from travelling abroad, if the patient can afford the expense.

The specific treatment that has been pointed out should be renewed every spring,

for the space of six weeks, to be recurred to for the ensuing five years.

It is hardly necessary to add that the patient should be warned to lead a regular and simple life.

In some cases of syphilis of long-standing, where the patient has been for a long time on specific treatment, medicine seems to have little or no effect. In one of those that came under observation at the Philadelphia Hospital, the woman had taken as many as sixty grains of iodide of potassium, together with a twentieth of a grain of bichloride of mercury, three times daily, and grew progressively worse; the old rupial sores remained unhealed, and the necrosis of the frontal bone was unstayed. In such a condition of affairs, it is best to stop all specific treatment, and turn attention to nourishing the patient and building up the constitution, when, should there be evidence of improvement, some good may be hoped for by returning to the judicious employment of specific remedies.

Very often patients complain and suffer from continuous pain in the bones, and, in spite of all treatment, grow progressively worse. The proper treatment is the careful employment of opium and its compounds. Avoid the use of chloral and the bromides, as in this condition they tend to produce nervous complications as serious as the ailments under which the patient is already suffering.

When, however, the pain is not severe nor continuous, a combination of eight grains of antipyrin with fifteen grains of the bromide of ammonium, given *pro re nata*, will often act very well. These remedies, however, soon lose their power.

Galvanic electricity will often give temporary relief, but is not believed to produce permanent benefit.

The faradic current is of service in stimulating the wasted muscles. It appears to be slightly stimulating, and has a tendency to produce a feeling of temporary comfort. It may be considered a substitute for light exercise.

When paralysis supervenes, attention to nutrition, the condition of the patient's skin, bowels, and general health are the indications.

The prognosis in the first stages is very favorable, when the patient is enabled to enjoy the comforts of a home and has the means to carry out the prescribed treatment, which is always expensive, and will occupy a lengthened period of time. The outlook, of course, is not as hopeful for a person who is relegated to a general hospital ward, where the luxuries of home and the necessary careful treatment are not possible. That they do recover, however, even under these disadvantageous circumstances is apparent from the result of one of the cases received into the Philadelphia Hospital, where the woman recovered health sufficiently to leave the institution. This person returned to her life of dissipation, experienced a relapse, again entered the hospital, and finally died from exhaustion.

In the second stage, where there is marked emaciation, attended with anæmia and great pain, the patient becoming slowly and progressively worse, the outlook is most grave; the poor creatures die either of marasmus, anæmia, or exhaustion.

Of the six cases so frequently referred to, three died, one quitted the hospital by request in a hopeless condition, and two recovered.

When the disease has passed to the stage of softening, the result, of course, is only a question of time.

The tendency to relapse is marked; indeed, it may be said that it is doubtful if a condition of robust health is ever attained. It is probable that there is always a great susceptibility to the development of some nervous disorder.

Any indiscretion in the manner of living will produce a relapse. After recovery, it will be necessary to make the art of living a study. The person must lead the most regular life, keep good hours, take care not to be guilty of any nervous strain, indulge in no excesses of any kind, eschew the use of alcoholic stimuli, and, if possible, avoid the use of tobacco.

PRESCRIPTION FOR DYSPNŒA OF HEART-DISEASE.

LITTLE, in the *Birmingham Medical Review*, states that he has employed for many years the following solution in the hypodermic treatment of the dyspnœa of cardiac disease:

℞ Sulphate of morphine, gr. iv;
Hydrate of chloral, gr. ii;
Atropine sulphate, $\frac{1}{10}$ gr.;
Camphor water, enough to make 4 drachms.
Sig.—Fifteen minims at a dose.

The chloral is added merely to make the solution keep. It renders the injection slightly painful, and may be left out if the liquid is to be used within two or three weeks of the time that it is prepared.

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Leading Articles.

THE TREATMENT OF INTESTINAL INVAGINATION IN CHILDREN.

INTESTINAL invagination, which, but a few years ago, was invariably treated by non-operative methods, is, with increasing statistics upon the subject, and with added knowledge of abdominal technique, becoming more frequently relegated to operation, even in the early stages of the disease. It is now generally recognized that but two forms of treatment can be considered,—first, etherization with rectal injection of either gas or liquid, possibly aided by gentle abdominal massage, or by electricity; and secondly, abdominal section, disinvagination, and closure of the abdominal wound.

What may be called mechanical treatment —that is, an attempt at disinvagination by rectal injection—is utterly rejected by what may be called the abdominal extremists, on the ground that it is an unreliable method, that it sometimes does more harm than good, even occasionally rupturing the bowel, and that it causes delay, since the beneficial effect of such treatment can often be discovered only after the lapse of some time. Hence the chances of success, when operation is finally necessitated, are distinctly lessened. Against this, however, must be urged the facts that there are on record hundreds of cases successfully treated in this way, that, if the method be properly applied, it causes but little loss of time, and does not increase the intrinsic danger of the case, and that it in no way complicates operation, if this ultimately may be found necessary.

Martin and Hare ("Wounds and Obstructions of the Intestines," 1891) direct, in the treatment of invagination, that the first resort should be to non-operative means, except in those cases where the severity of the symptoms and the amount of obstruction denote much strangulation, or where the case has not been seen for several days from the onset of the attack. Ether should be administered to its full surgical extent, producing complete relaxation of the muscular system; then, by means of a fountain syringe, hot sterilized .1 per cent. salt solution (bichloride of sodium) should be slowly forced into the rectum under a pressure of not over four pounds (elevation of the reservoir, eight feet), the liquid being retained by a shoulder upon the injection-pipe, easily made by wrapping the latter with a narrow bandage. At the same time the abdomen should be gently and thoroughly kneaded. This treatment should be continued for thirty or forty minutes. The final pressure should not exceed eight pounds (elevation of the water reservoir, sixteen feet). The trial at forced reduction must be thorough and final; there must be no idea that it is to be repeated with more care and attention to detail. If it fails, the surgeon must proceed at once to abdominal section, with the idea of accomplishing disinvagination directly. The positive failure of the injection method will be denoted by the fact that the tumor occupies the same position as before treatment and retains its full size. In this case the patient should not be allowed to come out from ether, but the operation should be undertaken at once. In many cases, however, it will be uncertain as to whether or not the injection has reduced the invagination; here the patient must be allowed to recover from his anæsthesia, when the subsequent course of the case will quickly

decide as to the success or failure of the method.

The statistical study of abdominal section in cases of invagination makes a poor showing. According to Ashhurst, 75.4 per cent. perish. Of Barker's forty-one cases collected between 1870 and 1887, 87.8 per cent. perished. He divides these cases into three groups. In the first there was found a reducible invagination; twenty-three such cases were reported, with five recoveries, giving a mortality of 78.2 per cent. Aldibert (*Revue Mensuelle des Maladies de l'Enfance*, tome x., Janvier, 1892), since 1880, has collected twenty-six such cases, with sixteen successes and ten deaths. This gives a mortality of 38.4 per cent.

The difference in mortality between Barker's and Aldibert's figures the latter attributes not only to the adoption of cleanly methods, but also to the fact that in recent times there has been a greater tendency to operate early.

Of Barker's fifteen cases where the invagination was found irreducible after opening the belly, all perished. In four the abdominal wound was closed without further interference; in seven the invagination was resected; in four an artificial anus was formed. Lockwood, of fifteen cases of intestinal resection for invagination, found that in three recovery followed. In Barker's three cases in which an artificial anus was formed, no effort being made to interfere with the invagination, all perished.

From these statistics it follows that even abdominal section holds but little hope when invagination has become irreducible. Hence the danger of delay, from which nothing can be hoped and everything feared. Although it is quite certain that the real mortality of abdominal section is much higher than is given by any table of statistics, since there is an unconquerable tendency to publish only successful cases; and, although all tables are absolutely misleading on this point, yet the figures of Aldibert and Barker are of great importance, as showing comparison of results under prompt intervention, according to skilful modern methods and under intervention delayed to the last possible moment.

DEATHS FROM CHLOROFORM.

ONE of the English journals has had so many reports of death from chloroform, that it is stated that the publishers have had a heading of "Deaths from Chloroform" stereotyped, so that it can be readily used with almost every issue. In the *Medical Press and Circular* for January 20, 1892, there are reported two more deaths from chloroform, occurring in the London hospitals, one at University College Hospital and one at Guy's.

The first case was that of a brewer's laborer, aged 45, who was about to undergo an operation for cancer of the tongue; the other was a laborer, aged 50, with fracture of both bones of one leg. The quantity of chloroform administered in both cases was stated to be very small,—not sixty minims. Every care was taken in administering the anæsthetic, and the usual treatment was resorted to for resuscitation.

The *British Medical Journal* of January 16, 1892, states in its editorial columns, under a heading similar to that of this article, "We regret to have to open the new year with the report of four recent deaths from chloroform." Two of these are those mentioned by the *Medical Press and Circular*. In one of them it is stated, in the *British Medical Journal*, that the respiration failed before the patient had taken a drachm of chloroform, and that, although artificial respiration was persisted in for two hours and a half, the man ultimately died, notwithstanding the fact that his heart kept beating for that length of time after respiration ceased. A verdict of "death by misadventure" was returned.

The other two cases were as follows: A carman, aged 47, was admitted to the Middlesex Hospital, having suffered from a great loss of blood from the bowel. Chloroform was given by a Krohne-Sesemann's inhaler, with a respiration indicator (a modification of Junker's). The patient took the chloroform well, and passed through the intoxicated stage, with the face but slightly congested. Four minutes after he was lifted on the operation-table the respirations ceased suddenly, although the cardiac pulsations continued. Various methods of artificial breathing were resorted to, tracheotomy was performed, and other means of relief tried without effect.

The fourth case of death was that of a shepherd, named McLaren, of Crieff, between 50 and 60 years of age, to whom chloroform was administered for the purpose of extracting teeth.

Here, then, are the reports of four cases of death from chloroform, three of which occurred in three of the largest and best-known hospitals in London, hospitals which have specially-appointed anæsthetizers, and where

every measure that could protect the patient from accident were resorted to.

Within the last week one of the most prominent gynæcologists in the United States said, in the presence of the writer, that he constantly employed chloroform as often as five or six times a day, because, if he did not, "he could not get through," and added, that he had "nearly had an accident" the day before. He had had to stand on the table and lower the patient's head to the floor, while he supported her by her limbs before the vital functions of respiration and pulsation were restored; yet, notwithstanding this recent exhibition of the dangers associated with the employment of this anæsthetic, he stated his intention to persist in its use.

Chloroform may be used in the Southern States, or in warm countries, where accidents from it seem very rare, through climatic or other influences; but we are convinced that in the Northern and Atlantic States this drug should never be employed as an anæsthetic unless ether is distinctly contraindicated.

THE TREATMENT OF PNEUMONIA.

PERHAPS there is no subject which has been so much written about as the subject of this leading article, and there is no other disease in which a larger number of drugs, or a larger number of remedial measures, have been recommended, save diphtheria. Notwithstanding these facts, papers continue to be written by those who see the largest number of cases, and the opinions expressed seem quite as contradictory as heretofore. The chief reason for this is that the disease pneumonia is one which is produced by different causes, is croupous or catarrhal, is sthenic or asthenic in type, and, finally, is either simple, complicated, or complicating. No malady needs the diagnostic power of the physician for its correct treatment more than this one, for, though the physical signs in the chest may be reasonably evident, yet the diagnosis does not stop here, for the physician must determine the condition of the general system, the idiosyncrasies of the individual, and the character and degree of systemic, circulatory, and respiratory symptoms. It seems hardly necessary, after the opinions expressed in other contributions to medical literature, for the writer to reiterate his firm belief in the great value of cardiac sedatives, such as veratrum viride and aconite, in the first stages of acute sthenic croupous pneumonia, and again the value of digitalis, sometimes associated with belladonna, in the second stage of the disease,—namely, when consolidation has occurred, or the circulation is feeble by reason of the reaction following the fever and excitement coincident with the onset of the disease. Briefly, the employment of cardiac sedatives at the very beginning of the attack, limits the inflammatory process by decreasing circulatory activity and excitement, and by allaying fever, which is one of the most powerful stimulants to the heart and to inflammatory processes. These drugs, in other words, relieve the engorged area of blood-vessels; first, by depletion; and secondly, by decreasing the force which is driving the blood into the area diseased. In the second stage, digitalis enables the heart to overcome the resistance offered to the pulmonary circulation by the consolidation, and puts aside the depression or collapse of the heart-muscle and vaso-motor system by stimulating them. Particularly is this result attained by the use of belladonna as a vaso-motor stimulant.

The reason for, or the exciting cause of, these remarks is the very valuable paper of Dr. Reed in this and the March number of the GAZETTE, and an article on the same subject by Pétresko, of Bucharest, in the *Bulletin Générale de Thérapeutique* for February 15, 1892.

Before considering these, however, let us indicate the conditions in which the depressants are contraindicated on the one hand and stimulants contraindicated on the other. If an attack of pneumonia supervenes upon an attack of typhoid fever, or towards the end of any one of the eruptive diseases which are severe and accompanied by marked prostration of the vital forces, it is evident that the disease is either directly or indirectly due to debility or depression, and the indications for cardiac sedatives, which are still further depressant, are not present. On the contrary, digitalis is the drug which is needed, for, by its increase of cardiac power, it sweeps out of the congested blood-paths the semi-stagnant blood, and so restores normal circulatory movement. It is the very depression of vital force which has produced the disease. When pneumonia attacks a strong, hearty, and previously healthy man, however, not only do the manifestations of the disease present a different aspect from that described, but the whole state of the case is diametrically opposed to the condition of the pneumonic patient, who is in an exhausted state when the

disease comes on. In the latter the patient's system may be likened to a woman in a nerve-storm of neurasthenia; in the former the system is like a strong man when angry. Both need remedies which, on the one hand, will support the system, to the relief of the nerve-storm, and, on the other, which will quiet wrath. The woman needs stimulants to bring her to, the man sedatives to calm him down. The treatment of pneumonia, therefore, does not consist in treating the disease, but in the treatment of the patient's condition which underlies the pathological process.

The paper of Pétresko, already quoted, is of interest, as showing the various methods by which drugs may be employed, and in this number of the GAZETTE will be found an item in the Progress columns, in which Robin points out, what some of us already know, that much of the difference of opinion regarding the physiological action of digitalis, as well as its employment in therapeutics, is due to a misunderstanding of its action when given in various doses. Thus small doses, such as are ordinarily given, slow the pulse, and so the drug is considered a cardiac sedative. In reality it is a cardiac stimulant, because it slows the pulse through the pneumogastric nerve, and increases the capacity and force of the heart, so that a greater amount of blood and force are put forth than before. It is, therefore, a stimulant. When the drug is given in very full doses, which may be called moderately toxic, the slow full beat previously present is soon replaced by a more rapid, more feeble, and more hobbling pulse, due to over-stimulation. For this reason those who use digitalis in such doses believe it to be a cardiac depressant, and indirectly it certainly is such. In Pétresko's paper we find two points, of which we have spoken, well exemplified, for he evidently sees a class of cases suffering from pneumonia which are quite different from those seen in America, and, in addition, he has used the drug in such overwhelming doses that it becomes a cardiac depressant. Thus he employs as much as one to two drachms of digitalis leaves a day for two or three consecutive days, the dose sometimes being as great as 6 drachms of the leaves in four or five days. He finds that this treatment results in a great fall of temperature after the first three or four doses, with a decrease in pulse rate. In other words, these enormous doses produce as much cardiac depression as do the ordinary drugs used for this purpose, and result in the aborting of the disease equally effectually. In this country these doses of digitalis would hardly be countenanced, and we cannot help believing that the digitalis employed by Pétresko must be of an inferior grade. He asserts that the tolerance of the drug is great, and that the report of one hundred and fifty-seven cases in which it has been used proves its usefulness and harmlessness. To give a stimulant in such massive doses as to produce a depressant effect is going a long way around when a direct effect might be reached through veratrum viride, antimony, or aconite. These are drugs which are used too little on the European continent, and in some portions the first and last are almost unknown as circulatory depressants. It is hardly necessary to add that, should these enormous doses of digitalis be given to a man in a condition of exhaustion, complicated by pneumonia, the result would be fatal. Such doses should not be given at all in our opinion, and we have mentioned them to condemn them; but, if used, they are indicated in the sthenic pneumonias of the young and otherwise healthy.

THE TREATMENT OF ERYSIPELAS.

ASIDE from the separation of cases of erysipelas from other patients who have abrasions of the skin, through which the germ of the disease may enter, the physician has a still further duty to perform not only in the treatment of the patient, so far as his symptoms are concerned, but also with the object of preventing a recurrence of the disease, for, in a certain percentage of cases, this accident frequently occurs. Thus there are some cases of recurrent erysipelas of the face which are due to the presence of an inflammation about the hair-follicles in the nose through which the infection seems to take place, or in other cases an obstinate rhinitis, by which the continuity of the mucous membrane is impaired, is present as a pathway for infection. Under these circumstances, the physician should remove the real cause of the attacks by local measures directed to the relief of these lesions before considering his patient as more than temporarily relieved of his disease.

The treatment of erysipelas which has yielded the best results in our experience is one which we have already recommended elsewhere, and which in each and every case proves to be singularly efficient.

It consists in washing the part which is af-

fected with a solution of bichloride of mercury, in the strength of 1 to 10,000, and then thoroughly anointing the skin with an ointment of ichthyol, of the strength of two drachms of ichthyol to the ounce of lanolin or benzoated lard. This having been freely applied, the part is protected by a layer of salicylated cotton and a gauze covering; or, if the disease involve the face, a piece of gauze can be used alone, with holes cut in it for the nose, eyes, and mouth.

This line of local treatment in the early stages of the malady diminishes the pain and relieves the tension of the parts, at the same time seeming to limit the area involved. When the case is seen after the attack is well advanced, the same treatment rapidly reduces swelling and induration, and produces so rapid a change for the better that the patient soon recognizes the advances which he is making.

It is hardly necessary to add that full doses of tincture of chloride of iron should be given in such cases; as much as 20 or 30 drops every four hours if the disease is severe. Since this has been written the article of Klim has been published, which gives practically the same treatment. This article may be found abstracted in the columns of Progress.

A CHAPTER OF MISTAKES.

AN interesting and ludicrous state of affairs, involving a surgeon, a coroner, and a medical society, has recently convulsed the medical profession of Indianapolis. According to a very able editorial in the *Indiana Medical Journal*, Dr. Wishard was about to operate on a patient, and having no professional brother to administer the anæsthetic,—chloroform,—intrusted its use to a second-year medical student. The drug was given by means of a paper cone containing cotton. The patient resisting, he was controlled by force, and the student directed to give him more chloroform. Immediately death ensued, and at the coroner's inquest the verdict was rendered of "death from gross carelessness on the part of Dr. Wishard, in allowing a student to administer the chloroform." No sooner was this verdict announced than the Marion County Medical Society promptly passed resolutions, censuring the coroner, who was a member of that body, for the verdict, and exonerating Dr. Wishard. As pointed out in the journal quoted, every portion of the transaction was surrounded by errors. In the first place, it is wrong to give chloroform in a closed inhaler; secondly, it is wrong to push the chloroform in large amounts against resistance; thirdly, it was a mistake to force the patient to lie down when a little well-directed persuasion would have quieted him and not strained his heart; finally, it was wrong to allow a student to give so dangerous a drug. So much for Dr. Wishard's side of the matter. The Marion County Medical Society's resolutions were wrong, because they blamed the coroner for a verdict which, while it was severe, was not outside of legal or moral justification, and their statement that no "criticism of the manner in which the anæsthetic was given can be made" is absurd. Finally, from a legal point of view, the president of the county society was in the wrong in entertaining a motion of censure of one of the members—the coroner—in his absence.

This somewhat complicated case serves to indicate once more the necessity of using chloroform carefully, that its use should be carried out by experienced anæsthetizers, and that all causes tending to produce fright or cardiac strain are of great importance, as exciting causes of fatal accidents.

ACUTE PURULENT OPHTHALMIA AND ITS TREATMENT.

WHILE there is practical unanimity in regard to the principles which should govern the management of the various types of acute blennorrhœa of the conjunctival culde-sac, there is a good deal of diversity of opinion concerning the strengths of various drugs which have been reported as efficacious, and a tendency to run after new remedies, the value of which has been heralded by one or other enthusiastic observer. For this reason an investigation by W. T. Holmes Spicer ("The Royal London Ophthalmic Hospital Reports," vol. xiii., Part II.), in which he has collected and analyzed the records of all the cases of purulent ophthalmia taken into the wards at Moorfields, from January, 1879, to December, 1890, together with those at St. Thomas's Hospital from December, 1880, to September, 1890, teaches some valuable therapeutic lessons.

The collection includes one hundred and fifty-eight cases of purulent ophthalmia occurring in separate individuals, of whom one hundred and twenty-six were males and thirty-two females; if each eye is taken as

a separate case, there were in all two hundred and fifteen. Cases of ophthalmia neonatorum are not included in his report. Gonorrhœal infection, direct or indirect, was present in one hundred and eleven males and fifteen females; seventy-five males and six females were stated to have recently had gonorrhœal discharge. In others there had probably been contact with discharge from the genital organs, or from a previous case of purulent ophthalmia. Seven cases were inoculated from nursing babies with ophthalmia neonatorum, and four were attacked on account of their association with persons suffering from gonorrhœal discharge. A special class of female children—the subjects of non-venereal discharge from the genital organs, who had inoculated their own eyes—is also included. Mr. Spicer records a number of interesting observations in regard to duration, sex, age, and the condition of the eyes upon entrance, which are not necessary for the purposes of the present note.

In his summary of treatment the following points deserve attention: "The cornea must not be allowed to remain bathed in a highly poisonous discharge. Frequent applications of cleansing lotions must be made. When the cornea was sound, as a rule, the applications were iced, or ice-pads were kept constantly applied to the eye; where the integrity of the cornea was endangered, as shown by infiltration or loss of perfect transparency, ice was not applied, but eserine drops used instead. Whatever was the nature of the cleansing lotion, simple ice-water, boracic acid, chloride of zinc, carbolic acid, or weak perchloride of mercury, the result was not affected; each, in turn, had a certain amount of favor."

Among the various kinds of treatment used more or less in combination, the following are noted: Nitrate of silver, in the form of the mitigated stick, or in solutions varying in strength from five to twenty grains to the ounce; chloride of zinc, ice, boracic acid, carbolic acid, perchloride of mercury, iodoform, quinine lotion, sulphate of zinc and alum. In single cases, sulphate of copper, resorcin, lapis divinus, peroxide of hydrogen, absolute alcohol, and Condy's fluid were employed. Among the measures used to combat corneal complications are mentioned the galvano-cautery, Saemisch's section, belladonna fomentations, atropine, and eserine. The last drug was employed twice as frequently as atropine.

Spicer concludes that there is no doubt in regard to the great superiority of strong nitrate of silver applied by the surgeon directly to the everted lids. In his opinion the percentage of recoveries depends more upon this factor than upon any other. In order to compare the results, all the cases in which the cornea was sound on admission are grouped together, with the result of the treatment, as follows:

Complete recovery, ninety-eight cases: strong nitrate of silver was used in eighty, or in eighty-one per cent.; strong nitrate of silver was not used in eighteen, or eighteen per cent.

Serious damage to, or total loss of, the eye: strong nitrate of silver was used in ten, or fifty-five per cent.; strong nitrate of silver was not used in eight, or forty-four per cent.

Burnham's cases, in which he advocated the use of carbolic acid, 1 to 20, are included. Spicer concludes, however, that while this form of treatment may secure very good results in the hands of its advocate, owing to some particular care of application, it must be shown to be generally successful before its claim for favor can be substantiated. From this stand-point carbolic acid is not found to be very efficient; its effect is less lasting than nitrate of silver; it has to be applied more frequently to the everted lids; it gives more pain, and may possibly damage the cornea.

Although perchloride of mercury, four grains to the ounce, was used in a number of cases, they are not of sufficient number from which to draw satisfactory conclusions. The mitigated stick of perchloride of mercury applied to cases of ophthalmia neonatorum was given up in favor of the strong silver solutions. Although it has been shown that Buller's shield is a very useful means of protecting the sound eye, it is not an unmixed blessing, and in a number of cases inoculation of the uninflamed organ occurred in spite of the application of this protective dressing. The great difficulty is that its application may be inefficient, and that the plaster by which it is kept adherent to the margins of the brow, etc., becomes loosened, and permits the entrance of the infecting discharge.

The following are the conclusions: The most noteworthy results of this inquiry show the extreme danger of postponing treatment; in other words, the great value of treatment; the increasing dangers of the eye with increasing age; the weakening of the activity of the poison with the duration of the dis-

charge; the care needed in the application of Buller's shield to the sound eye; and, above all, the very great superiority of strong nitrate of silver over all other forms of treatment.

Reports on Therapeutic Progress.

STRYCHNINE FOR DEATH-ADDER BITE.

HUNT, of Queensland, reports the case of a child, aged 16 months, who was admitted to the hospital under his care, having been bitten by a death-adder three hours previously. Immediately after the bite, the relatives of the child cut off the finger and sucked the stump, then drenched it with ammonia, and applied ligatures to the arm; also giving some ammonia and brandy by the mouth, which were promptly vomited. The child was now driven to town, a considerable distance, and during the drive became very listless and plastic, in spite of all attempts to keep it roused.

When first seen it was almost comatose, the body and extremities were cold and clammy, the pupils widely dilated and insensible to light, the pulse feeble and irregular, and the face pinched and slightly cyanotic. It was at once wrapped in hot flannels, hot water bags were applied to the feet, and strychnine injected into the right arm in the dose of $\frac{1}{30}$ of a grain. The ligatures were then removed, and a strong faradaic current applied to the nape of the neck and along the spine. Fifteen minutes later a thirtieth of a grain more of strychnine was injected, and the child then began to manifest some improvement. The pulse was better, the pupils began to contract, the bodily heat was restored, and the stimulus of the battery was responded to more vigorously. The mental faculties became extremely acute, and the child recognized and played with its parents. A few slight twitches occurred, and then passed off. Ultimately the child entirely recovered, and was none the worse for her mishap, except for the loss of the finger. As pointed out by Hunt, the bite of the death-adder proves exceedingly fatal, and he places the recovery of the child to the credit of the strychnine.

The following cases are also reported in the same number of the *Australian Medical Gazette* as is the case of Dr. Hunt.

A woman while carrying a log of wood to place on a fire was bitten on the arm by a snake, and was then taken fifteen miles to Gulgong to Dr. Bennett, who found her in a state of collapse, with cold extremities, and almost pulseless. Morphine was applied without effect, and he then injected strychnine three times, at intervals of fifteen minutes, the patient soon regaining consciousness and a good circulation. The following morning she was quite well, and felt no ill effects. The dose of strychnine is not named.

Another case is also reported in the *Australian Medical Gazette*, in which a man was bitten on the hand by a tiger-snake, after which ligatures were promptly put around the wrist. The bite was scarified and ammonia injected. The patient had to be taken seventy miles in a steamer before medical aid could be obtained, at which time he was almost comatose. Strychnine was injected, and the patient recovered.

Still another case is that of a young man, 20 years of age, who was bitten on the leg by a snake, the variety of which is not stated. The bite was scarified, and ammonia and spirits administered. At first the symptoms were relieved, but subsequently dangerous symptoms appeared, and the tongue and various portions of the body became swollen to an alarming extent. In this case strychnine was not used, and death ensued.

In still another case, a young man of 19 was bitten by a tiger-snake, and notwithstanding the application of ligatures and sucking of the wound, he immediately became drowsy and staggered in his gait. Nine and a half hours later he was in a drowsy state, but a little better than he had been. A thirtieth of a grain of strychnine was given, the wounds were incised, and all the venous blood in the arm expressed. The veins on the back of the hand were then freely bled, as was also the median cephalic vein, after an Esmarch bandage had been applied above the elbow. Another injection of a thirtieth of a grain of strychnine was now made every hour, to counteract the distinct tendency to cardiac failure which was present. Several hours later, notwithstanding this treatment, the pulse became feeble and fell to 46; one-twentieth of a grain of strychnine was again given hypodermically, and the pulse returned to the normal.

In this case the reporter, Dr. Stoker, believes that recovery is to be attributed, first, to the effective ligaturing of the arm; secondly, to the energetic local depletion which he resorted to; and thirdly, to the employment of full doses of strychnine.

A large number of other cases are reported of a similar nature, and it would be well for those who see much of snake-poisoning to remember this use of strychnine, in addition to the directions given by Dr. Barber in the January number of the THERAPEUTIC GAZETTE in regard to the treatment of rattlesnake-bite by potassium permanganate.

POISONING BY COCAINE.

In *La Médecine Hypodermique* for January, BERGER reports the following case in which there were toxic effects from the use of cocaine. A young man suffering from hydrocele, which had rapidly developed, was to be treated by aspiration and the subsequent injection of iodine. Previous to the injection of the iodine, the interne introduced into the sac a solution of cocaine representing about six grains. In a few minutes the anæsthetic liquid was withdrawn and immediately replaced by a solution of iodine. Shortly after the patient complained of malaise, there was extreme pallor of the face, the pupils were dilated, frothing at the mouth, and general convulsions were present. Death finally ensued.

At the autopsy there was found insufficiency of the mitral valve, with pronounced atheroma, and it was considered that death had been due to the use of the drug in the presence of a cardiac lesion.

As pointed out by the editor of *La Médecine Hypodermique*, it is unfortunate that with the onset of the first symptoms hypodermic injections of caffeine and large doses of chloral and bromide of potassium were not resorted to. Under such circumstances it would have been well to give thirty grains each of these drugs.

[Although in the large number of cases which are on record where cocaine, used for the relief of pain in the treatment of diseases of the external genitals in man, has produced serious symptoms and often death, it is not to be forgotten that there are other instances on record in which the injections of iodine into cysts or cavities in the body have been followed by equally unfavorable results, and by symptoms quite similar to those which are recorded. In a number of instances where iodine has been injected into the pleura, violent epileptiform convulsions have occurred. In view of these facts, the accident may have been due quite as much to the iodine as to the cocaine.—ED.]

HYPODERMIC INJECTIONS OF ETHER IN OPIUM-POISONING.

In the *Pacific Medical Journal* for January, 1892, DR. DAWSON reports the case of a woman who was suffering from opium-poisoning. On his arrival there was a condition of complete coma, cyanosis, frothing at the mouth, convulsions, a weak and rapid pulse, body covered with perspiration. She was thought to be dying. No history was obtainable from the friends. The pupils were contracted, and the chance diagnosis was made of opium-poisoning. Hypodermic injections of brandy were given, and dry heat was applied over the heart, while her arms and legs were rubbed with mustard, and bottles of hot water applied to her feet. Ether was now given hypodermically into the arm. In a short time a reaction was noted, and an hour later another injection was given. After this consciousness returned, and the patient made a good recovery.

Dawson also states that he has treated another case of morphine-poisoning in a similar manner. In this instance the respirations were four and five per minute and the patient's condition was alarming. After ether injections speedy recovery followed. He points out very properly that the needle should be inserted deeply into the tissues in order to prevent the formation of abscesses. The powerful effect of ether as a respiratory and cardiac stimulant is well known.

COMPARATIVE VALUES OF THE DIFFERENT DIGITALINES OF COMMERCE.

In the *Bulletin Général de Thérapeutique*, FOUQUET contributes a research from the therapeutical laboratory of the Cochin Hospital of Paris, in which he has studied (1) the crystalline digitaline of the French Codex as prepared by Adrian, and which Arnaud has considered as chemically pure; (2) the amorphous digitaline prepared according to the method of the Codex by the same chemist; (3) the German digitoxin and the digitaleine prepared by Adrian; and finally, the German digitaline, which corresponds to the digitaleine of the French.

Experiments were carried out upon frogs in ten series of five experiments each, upon dogs in six instances, and upon rabbits in four series of three experiments. The hypodermic method of administration was resorted to, the drug being dissolved in alcohol or water.

The conclusions which Fouquet reaches are as follows:

1. There exists in digitalis an active principle, fixed and definite, which is digitaline, and which possesses all the properties of the plant itself.

2. Besides digitaline, there are other compounds sold in commerce under the name of digitaline, which are not identical. These digitalines may be divided into two groups: those which are soluble in chloroform and insoluble in water, and which are as follows: 1. Crystalline digitaline, amorphous digitaline, and digitoxin. 2. The digitalines which are insoluble in chloroform and soluble in water,—namely, the German digitaline and digitaleine. The products of the first group, when in a state of purity, possess the same activity and may be employed by the physician with confidence. The drug should be administered in large doses,—$\frac{1}{60}$ of a grain at a time if diuresis is insufficient; $\frac{1}{100}$ of a grain may be given on each following day. Care should be exercised that a cumulative effect is not obtained.

TREATMENT OF ERYSIPELAS BY ICHTHYOL.

In connection with the leading article upon this subject in this number of the THERAPEUTIC GAZETTE, the following conclusions, reached by KLEIN, of Warsaw, are of interest:

1. Ichthyol undoubtedly checks the progress of the disease, either by its reducing action on the tissues, or by its direct action on the microorganism, or by both actions simultaneously.

2. Ichthyol shortens the mean course of the disease by about one-half.

3. The period of treatment is from three to four days.

4. The course of the disease is considerably milder when ichthyol treatment is employed.

As regards its mode of employment in the clinic, equal parts of the ordinary ichthyol and vaseline made into an ointment were made use of. If the erysipelas covers an extensive surface, a weaker preparation will suffice,—equal parts of ichthyol, lanolin, and water. If the dilution is still greater in hairy parts, it can be gently rubbed. Before using the ichthyol, any wound present should be thoroughly cleansed and disinfected, and parts affected with erysipelas should be well washed with warm water and soap. Ichthyol is best rubbed in with the hand, commencing over the healthy skin, about a hand's breadth from the affected part, and gradually passing over it. The inunction should be as vigorous as the tenderness of the parts will allow, and as much ointment should be used as will leave the whole skin of a uniform dark-brown color. After the inunction, the parts are to be wrapped in a thin layer of hydrophile gauze moistened in salicylic water, and over this a thicker layer of non-absorbent cotton must be lightly fixed with a bandage. This procedure is to be repeated three or four times a day, and for three or four days, until the temperature has become normal. If the treatment be interrupted too early the disease will recommence.—*Medical Press and Circular.*

THE USE OF DIGITALIS AND STROPHANTHUS.

DR. JAMES LITTLE, writing for the *Birmingham Medical Review* for February, 1892, after pointing out that digitalis is the most important cardiac remedy in the Materia Medica, goes on to compare, in an interesting manner, its power with that of strophanthus. He says, "Strophanthus shows its power in the same kind of cases as digitalis, when the systoles are frequent and marked, but is less useful when the pulse is regular and there is weakness of the left ventricle." He thinks that the tincture of strophanthus, like the tincture of digitalis, should not be mixed with water until just before it is swallowed. He also believes that when strophanthus is given in this form, 15 minims every four hours is not too much. He concludes (1) that digitalis is the better drug of the two because it is more frequently useful. (2) If slowing and steadying of the heart has been produced by digitalis, it is well to keep up its action by occasional doses. (3) There are some patients whom digitalis sickens, and a smaller number in which it seems to fail to bring about an increase in the force of the heart. Under these circumstances strophanthus may prove itself useful. Patients who have widespread thickening of their smaller arteries are sometimes benefited much more by strophanthus than by digitalis. (4) Strophanthus is much more rapid in its action, but is not suitable for prolonged use. He has also found that bromide of potassium in small doses, given twice or thrice a day, sometimes serves to quiet disturbed cardiac innervation.

THE TREATMENT OF HÆMATO-CHYLURIA WITH THE BICHROMATE OF POTASSIUM.

DIAGO has reported to the Clinical Society of Havana results which he obtained by the administration of the bichromate of potassium in seven cases of hæmato-chyluria. The dose which he has administered is $\frac{1}{3}$ to $\frac{1}{2}$ grain in half a pint of water. In three of the cases

the filaria were found and in four others there was profound anæmia. This medication was employed to the exclusion of all other treatment. Of the cases, four were cured without other treatment and two in forty-eight hours, while the others found relief in about fifteen days. The three cases which were complicated by the presence of filaria were found most rebellious to treatment. The author believes that the bichromate of potassium is a very useful remedy in the treatment of the malarial, pernicious anæmia of the tropics.—*Revue Internationale de Bibliographie Médicale*, February, 1892.

SNAKE-BITE.

Apropos of the paper by Dr. Barber, in the January issue of the GAZETTE, the report of a case by BANERJEE in the *Indian Medical Gazette* for December, 1891, is interesting.

The patient was a boy of 11 years, bit by a small snake upon which he trod by accident. The wound was below the right inner malleolus, the edges black, with blood oozing from a scratch, which had been made by the friends, near the bite.

The treatment consisted in making free and deep incisions around the punctures, but cauterization was not resorted to, because it was thought that the poison had already found its way into the circulation. The wound was then washed, and dressed with a strong solution of potassium permanganate, five grains to two ounces of water; and, finally, two drachms of a ten per cent. solution of potassium permanganate were injected in drachm-doses in the left arm hypodermically. The symptoms of poisoning increasing, a solution of strychnine in glycerin was injected into the other arm every half-hour, until the total quantity of strychnine injected was about half a grain. At this time slight twitching appeared in the limbs and neck, and the drug was discontinued, and followed by ammonia in 20-minim doses, given every fifteen minutes. The patient entered the hospital at half-past eight in the morning, and was discharged at half-past twelve, noon.

In a criticism of the case which follows, the author concludes, first, that ammonia is of no value, excepting in so far as it aids the respiration; secondly, that the solution of permanganate of potassium was useless; and thirdly, that the strychnine was the valuable remedy in the case.

[It will be remembered that, according to Dr. Barber's paper, and the researches of Mitchell and Reichert, permanganate of potassium, when used in snake-bite, is to be injected into the neighborhood of the wound, and is not supposed to be of any advantage whatever when given hypodermically for a general systemic effect. Perhaps, if the permanganate had been used properly its effect might have been different.—ED.]

TOXIC ACTION OF IODOFORM.

DR. J. A. DE C. WILLIAMS, in the *Medical Press and Circular* for January 20, 1892, details the following peculiar phenomena attendant upon the treatment of a patient by iodoform, which are interesting and instructive.

P. M., aged 50, whose business was carried on in-doors and chiefly in the standing posture, presented himself on May 27, 1891, suffering from an indolent ulcer of the left leg, situated on the lower third of the fibula, of very large size, and with unusually deep and hard edges. The patient was a tall man, who suffered from cold extremities and œdema of the feet, and was of periodically intemperate habits. He complained of burning heat in the region of the ulcer. Having relieved him of the burning complained of by cold lotions and rest of the leg in an elevated position, Dr. Williams removed the hard edges by blistering, and, by bandaging the limb and strapping the ulcer, succeeded in levelling its circumference, building up the constitution by enforced regular habits and tonics. At the same time the œdema disappeared under the exhibition of digitalis, and general diuretic treatment. The ulcer, nevertheless, continued unhealed, in spite of the use of astringents and caustics.

On July 6 it was determined to try an iodoform dressing, which was applied in the form of the powder dusted over the surface of the ulcer, which was covered at the time with an ichorous and unhealthy pus. Bearing in mind Mr. Treve's remarks in the *Practitioner* of October, 1886, care was taken not to bandage tightly or in any way to unduly confine the dressing, which was covered with gauze lightly applied, and secured at the edges with strips of plaster.

The next morning the patient complained that he had passed a very bad night, which he attributed to the application. He had been feverish and restless, and suffered from a burning heat in the region of the ulcer, more severe than he had experienced before treatment. Locally, there was a fine red

eruption round the ulcer, while the tongue was furred, pulse accelerated, temperature 100.8° F., pupils dilated, with headache, and disinclination for food. As he confessed to having walked about a good deal, and taken a glass (?) of spirits with a friend, Dr. Williams was inclined to doubt that these symptoms were purely the result of the iodoform-dressing; but, as he expressed a great dread of continuing the application, a cooling lotion was substituted, and after two days all disagreeable symptoms disappeared. After a fortnight, the ulcer not having made any forward progress, it was determined to try again the iodoform, and having secured the co-operation of a friend of the patient, who was absolutely reliable and an abstainer, to see that he would keep quiet and take no stimulants, the powder was again applied, without telling him it was the same drug. The powder was applied at 4 P.M., and about eleven o'clock that night the burning sensation commenced, and continued to increase in intensity until about five in the morning, when he obtained some relief by cold-water applications. On seeing him about 10 A.M., he complained of the excessive heat in the region of the ulcer, of headache, vertigo, and sickness of the stomach; the face was flushed, the tongue coated, pupil dilated, temperature 101°, and pulse 120. There was an erythematous areola around the ulcer, with a fine red eruption extending up the leg, with maculæ exactly resembling petechiæ. Altogether the constitutional disturbance was alarming. His friend corroborated his statements that he had taken no spirituous liquor, and that he had not taken any violent exercise, nor other than his usual food; in fact, that he had never been better than he felt that day until the burning commenced, and the patient stated that he "thought I must have applied some very powerful medicine to the sore that morning." Careful washing and poulticing of the ulcer, followed by plain water-dressing and a full purgative, soon did away with these distressing symptoms, and it is needless to say that the iodoform was not used again.

Individual susceptibility to the toxic action of the drug largely contributed to these severe sequelæ, as Williams had lately used it in similar cases with no untoward results. The remarkable features of this case are the extreme local irritation caused by the iodoform on two occasions, and the appearance of petechiæ the second time it was applied, as it is generally credited with anæsthetic and sedative properties, and is stated not to be an irritant by so high an authority as Binz. Williams cannot, however, forego the opinion that a local congestion, caused by the stimulant action of the drug, resulted in a hemorrhagic extravasation, as manifested by the petechiæ; and as Williams has not heard of the latter before in connection with iodoform-poisoning, he should be interested to know of any similar results from the same treatment. Subsequently the ulcer healed under treatment by *pulvis aluminis exsiccatus* being dusted on its surface, being finally skin-grafted when the proper stage of healthy granulation had arrived.

TREATMENT OF ACUTE PLEURISY IN PARIS.

A great number of medical men of the present day consider that the immense majority of pleurisies are of a tuberculous nature, and consequently the treatment should be antitubercular. However, this opinion is far from being received in Paris. M. Germain Sée is one of those who believes in the microbian origin of pleurisy. He considers blisters as useless, and has no confidence in the different agents for internal medication, neither in diuretics, as milk and digitalis, nor in purgatives or sudorifics. Recently antipyrin was proposed, but it did not give satisfactory tests. According to Sée, the patient should be well alimented, in order to have strength to struggle against the invasion of the microbe. Thoracentesis should not be made before the twentieth or thirtieth day, otherwise the effusion will be sure to return.

Professor Hayem, on the other hand, considers salicylate of sodium as capable, given internally, of reducing considerably the amount of the liquid. He discards blisters.

M. Lecorché follows the old classical method, as does also Professor Strauss.

M. Talamon has confidence only in thoracentesis. However, he does not have recourse to it in every case, as many pleurisies get well by simple rest in bed. In any case he does not practise it before the third week. He orders no blisters nor any diuretics, as he believes them hurtful.

Professor Dieulafoy says that in acute pleurisy there are two indications,—treatment of the pain and of the effusion. For the pain a small blister might be applied, or an injection of morphine given. When the liquid has exceeded a quart, tapping must be done, but all the liquid should not be drawn off at

once, in order to avoid the accident so often witnessed in thoracentesis. The operations can be repeated a few days afterwards, if necessary. The needle should be inserted in the eighth intercostal space, below the angle of the scapula. He never employs blisters, diuretics, or purgatives.

M. Huchard submits his patient to a milk diet, and orders a mixture containing squills and digitalis, with an occasional blister. He considers that pleuritic patients in general are candidates for tuberculosis, and, consequently, should be looked after.

M. Dujardin-Beaumetz is a warm partisan of revulsives. He employs large blisters, and renews them from time to time.

M. Moutard-Martin gives his preference to painting with tincture of iodine and the administration of quinine.

M. Faisans said that, when called at the *début* of acute pleurisy, he employs wet-cupping, in order to relieve the pain and the oppression. As long as the effusion remains within bounds, he orders no other treatment; no blister as long as there is fever, no purgatives, no pilocarpine, and in general, no diuretics, unless the patient insists on his "doing something." According to M. Faisans, there exists no medical treatment, properly speaking, for pleurisy. Thoracentesis is the treatment *par excellence* when the liquid shows no tendency to diminish.—*Medical Press and Circular*, January 27, 1892.

CHLOROFORMUM MÉDICINALE PICTET.

Du Bois-Reymond has published an exceedingly interesting paper on chloroform, which has been translated from the *Pharmaceutische Zeitung*, and published in the *Bulletin of Pharmacy* for January, 1892.

Thus far the medicinal chloroform of Pictet has been looked upon as a novelty, and has provoked all the more interest, since it has been produced by means of an apparatus of equal importance to all branches of science. At the same time rather unfavorable opinions respecting the new process came from certain quarters. It has been declared that the medicinal chloroform of Pictet is not to be distinguished chemically from ordinary chloroform. Happily, we are enabled to present in the plainest manner to every one desirous of seeing it, the immense difference between the two products in the deposited residues. These consist, in the case of the ordinary article, of substances which chemists are wont to designate as "schmiere" (fatty matter).*

There can be no doubt whatever of the absolute purity of the new product, for the reason that crystallization has ever been regarded as an evidence of chemical purity. The best distinguishing reaction is that with sunlight. Ordinary chloroform — viz., chloralchloroform—decomposes under sunlight almost instantaneously. Pictet's medicinal chloroform, on the other hand, without any addition, resists the action of the sun better than the chloroform mixed with alcohol. If of two specimens of a substance one is decomposable, the other constant, the latter is beyond doubt the pure one, for the decomposition is caused only by the foreign admixtures. Who can fail to see the analogy between the conduct of chloroform and that of lunar caustic, which, as is well known, remains unmodified under sunlight only when absolutely pure? Simply in order to fulfil the requirements of the Pharmacopœia, the prescribed addition of alcohol is being made provisionally to Pictet's medicinal chloroform. Positively pure alcohol, prepared for this purpose by a special process, is alone employed. Professor Pictet intends, however, soon to place on the market, as a specialty, absolute chloroform, representing the molecule $CHCl_3$; and the process is so cheap that the new chloroform is not so dear as various special brands have always been.†

The advantages supposed to be presented by chloroformum médicinale Pictet are threefold,—avoidance of baneful accidents, superior narcosis, assured permanence. The accidents alluded to are not only troublesome, such as vomiting, excitation, and

* As much as nine years ago, the question was raised in England respecting the noxious admixtures found in chloroform, and characterized as a yellow oil of specific odor. At that time one of the largest firms offered to place at the disposal of scientists chloroform and its preparations for the purposes of physiological investigation. This proposal, however, seems to have remained without result (*British Med. Journ.*, 1882, i. p. 563; see also Lucas Champonnière, *Bull. de la Soc. de Chir.*, i., 1881). "Fatty matter" is certainly a very peculiar expression in this connection and a decided proof of our ignorance. The term itself appears also in the description of wine analyses. French writers on the subject speak of greasy, oily, fatty wines, and Pasteur ascribes the phenomena to the growth of a ferment. Readers interested in this subject will find good illustrations of this "greasy" substance, as shown by the microscope in Baudrimont's "Dict. d'Alter. et Falsificat., 1882, subject "Vin."—J. B. N.

† *Journ. de Pharm. et de Chim.*, 1882, 5, 226.

subsequent nausea, but, in part, dangerous. Now, the mode of action of chloroform, and hence the cause of the so-called chloroform-death, are completely unknown. A not inconsiderable number of cases—namely, those where death follows immediately upon the first inhalations—are, moreover, not properly ascribable to chloroform.*

Simpson quotes a number of cases which occurred before the employment of anæsthesia, which to-day would be very probably included in the number of chloroform-deaths.† But in the assured cases the quality of the chloroform certainly plays an important part. The first danger, according to almost all authorities, lies in the interruption of respiration. Kappeler states distinctly that this danger has its efficient counter-agent in the form of artificial respiration. Only when the observation of the pulse was preferred to that of the respiration did chloroform-deaths begin to be more frequent ‡

Every impediment to respiration, no matter how slight, must accordingly be removed. Gentle irritation of the air-passages has a disproportionately greater effect upon respiration than overtight clothing. Liebreich teaches us that for this reason chloroform-narcosis in the rabbit proceeds normally only under employment of the tracheal canula. But the purer the chloroform the milder its odor, and in this respect Pictet's medicinal chloroform is unequalled. Further, it has been statistically shown that in England more than five times as many cases of death result from the use of anæsthetics as in Germany. According to Herr von Bergmann, there is one death to every seven thousand narcoses in Germany, and, according to Berend (*Chloroformkasuistik*, Hanover, 1886), one to twelve hundred and fifty in England. Moreover, anæsthesia is looked upon and taught as a special branch in England. There can scarcely be any considerable difference of climate or population. But may not the English chloroform be distinguished, to its disadvantage, from the continental, by just such impurities — scarcely perceptible to chemical test—which are separated by the Pictet process? This thought justifies the hope that, through the introduction of Pictet's medicinal chloroform, a part of the total number of chloroform-deaths may be avoided. Liebreich, in whose mind the method was first conceived, and Bardeleben, in whose clinic a large series of narcoses, with Pictet's medicinal chloroform, were first performed, unite in regarding the success stated as tolerably assured. Sédillot, in France, who attached the greatest importance to the use of only the best chloroform, had not a single chloroform-death to report (*Bull. de la Soc. de Gar.*, 7, 1881). He summarizes his experience in the sentence: "Pure chloroform, well given, never kills." Lucas Championnière divides the dangers of narcosis into two categories,—first, individuals disclose varying sensibility to the noxious action of chloroform; second, this banefulness varies greatly in intensity as a result of the imperfections of the chloroform. He fully shares Sédillot's opinions, and shows by a very large number of clinical cases the noxious influence of impure chloroform, and the necessity of employing only the best preparations. In his list are many gynæcological cases, in which prolonged semi-narcoses were required. In this respect, he comes to the conclusion that a chloroform may be perfectly satisfactory to the surgeon, and yet be inadmissible for purposes of anæsthesia in labor.

That vomiting, excitation, and depression seldom follow the use of Pictet's medicinal chloroform is shown by the satisfactory reports which are coming in from all sides. On the other hand, a more advantageous quality of narcosis is achieved in so far as the anæsthesia is wont to supervene very quickly, the reflexes still prevailing, and also to persist long after cessation of the inhalations. And if, even under the most favorable conditions in appropriate operating-halls, the benefits of a really pure chloroform assert themselves, how much more value must such purity possess in private practice? By far the greatest number of narcoses are not conducted in apartments fitted up for the purpose.

The chloroform carried along in response to sudden calls by country doctors who do not operate frequently, that which ship-surgeons and the inhabitants of other climates employ, doubtless is often unequal, even to the requirements of the Pharmacopœia. For this reason ether, which is overvalued by the English authorities, is regarded as altogether inadmissible in India. The chloroform which was supplied to the field hospitals during the recent wars was notoriously unavailable in a large measure.

* Nussbaum, *Handb d. allgem. u. spez. Chir.*, 1867, i., ii. p. 612; Laurie, the *Lancet*, 1880, i. p. 149.

† *British Medical Journal*, 1870, i. p. 199.

‡ F. Hewitt, Proc. of the Royal Med. and Chir. Soc., London, 1890.

TREATMENT OF CANTHARIDAL CYSTITIS BY INJECTIONS OF COCAINE.

In the *Revista de Ciencias Medicas de la Habana*, ALBARRAN reports a case in which, by reason of grave pulmonary lesion, active cantharidal vesication was resorted to. After a short time active symptoms of vesical irritation were developed and capsules of the monobromate of camphor were given without result. Injections of morphine only produced temporary relief. A second application of the vesicant produced a second time the phenomena of cystitis, but injections of morphine gave no more relief than before.

Albarran then resorted to the injection of 15 drops of a solution of cocaine into the bladder. There was immediate relief of the pain, which entirely disappeared. He believes that it would be well to administer cocaine in a similar manner for severe vesical irritation arising from this or similar causes.—*Revue Internationale de Bibliographie Médicale*, February 10, 1892.

REMITTENT FEVER TREATED BY KINKÉLIBAH, OR COMBRETUM RAIMBULTIR.

RANSON, in the *Archiv. de Méd. Navale et Col.* for December, 1891, contributes some observations made by him in the Soudan upon cases of violent remittent fever, in which an infusion of the arborescent plant already named, which grows in Western Africa, was used with success. The leaves can be dried and preserved for years without the loss of active properties. These are reduced to a powder and made into an infusion in the proportion of one drachm to a half-pint of water. At the onset of the fever, particularly if there is hæmaturia, a wineglassful of the decoction is given every ten minutes, vomiting is thereby produced and favorable symptoms follow the remission which comes on at once. After the employment of this drug, the employment of quinine is resorted to.—*Revue Internationale de Bibliographie Médicale*, February 10, 1892.

TREATMENT OF EPILEPSY BY BORAX.

MAIRET recently delivered a lecture on the treatment of epilepsy by borax, in which he pointed out that certain precautions are necessary in its employment, explained its physiological action, and spoke of the untoward symptoms which it might produce. In the first portion of his discourse he stated that the chief effects of the drug are exercised upon the alimentary canal and skin, so that if overdoses are given, the drug produces nausea and considerable diminution in the appetite, and it may be vomiting and diarrhœa. Upon general nutrition it tends to produce emaciation. There is very frequently puffiness of the face, œdema of the extremities, and finally a true alkaline cachexia may develop. The changes in the skin consist of either papular or scarlatinous eruptions. In the case of the eczematous and papular varieties, it is noted that the eruption frequently begins about the joints and then spreads to other portions of the body. The scarlatinaform eruption, however, manifests itself on different portions of the body, on the face, and on the feet, and is followed by desquamation in much the same way as is the eruption of scarlet fever. A fourth and fifth variety of the eruption from the use of the drug may be like that of rubeola, or, in other cases, furuncular. For these reasons, during the administration of borax, great care should be paid to alimentation, and particular attention is required that the drug is not pushed far enough to produce nausea and vomiting. Hydrotherapy is found to be a valuable measure for the untoward symptoms should they appear, and it is well to give tonics, such as iron and quinine, with astringent mixtures to control the diarrhœa; or, in their place, good results may be obtained by the use of naphthol or the salicylate of bismuth. (It is generally taught that quinine is contraindicated in epilepsy.—Ed.) In other cases arsenious acid may be given.

One of the chief causes of the nausea and loss of appetite produced by borax is its disagreeable odor and taste. In order to obviate this difficulty as far as possible, it is well to employ the drug in one of the following forms:

℞ Borax, ʒiiss;
Glycerin, ʒvi;
Licorice mixture, ʒiv.

Or,

℞ Borax, ʒiiss;
Glycerin, ʒvi;
Strong coffee, ʒi;
Sugar of milk, ʒiiss.

Or,

℞ Borax, ʒiiss;
Glycerin, ʒiss;
Syrup of bitter orange, ʒiii.

In other cases it may be found well to make the borax into a confection, and administer it in that manner, but it is not considered wise to give the drug in capsules.

In regard to dosage, Mairet commences with small doses of 8 to 15 grains, and gradually increases the dose until it produces some disturbance of the alimentary canal. In some cases

it is a long time before these disturbances appear. Ordinarily, however, they come fairly early, and it is well to take precautions to prevent any untoward effects. However, instances are on record where as much as two and a half drachms a day have been taken. Sometimes this treatment has extraordinarily good results. Mairet states as a law that, if two drachms a day are not sufficient to completely control the attacks, larger doses are useless. It is also noted that when these very large doses are employed continually, the drug loses its effect. If the borax diminishes the attacks and it is thought necessary to continue its influence in comparatively small doses, it may be given in the amount of from fifteen to thirty grains a day. Larger doses than this, if persisted in for long periods of time, produce disagreeable effects. Should the attacks recur as soon as the small doses are resorted to, they should be once more increased. In regard to the time of day at which the dose should be given, the remembrance that the drug acts chiefly upon the alimentary canal indicates that it should be as far away from meal-times as possible. It may, therefore, be given early in the morning and late at night on going to bed, in order that digestion may not be interfered with. This method of administration is particularly useful in those cases which suffer from nocturnal attacks.

From the studies which have been made in France and other countries, it would seem that the profession in America have not given this drug a sufficiently thorough trial in this disease, the effective therapeutics of which are so limited.—*Le Progrès Médical*, February 6, 1892.

THE ACTION OF DIGITALIS.

In a lecture delivered by ROBIN, in regard to the action of digitalis, he reaches the following conclusions:

First. When digitalis is given in powder, it develops an irritation of mucous membranes. For this reason it should be administered in small doses and not in pill form, because under these circumstances it may produce irritation of the stomach.

Second. Digitalis undoubtedly possesses a cumulative influence, and as its active principles are eliminated very slowly from the body, for this reason it is not safe to continue it for long periods of time.

Third. Digitalis in small doses decreases the pulse-rate, but in large doses accelerates the pulse. This is the secret of the difference of opinion of physiologists. The results obtained by the smaller dose are those which are desired in medicine, and acceleration of the heart shows that dangerous quantities of the drug are being used. It is important to remember that the action of the drug persists for a long time after its administration.

Fourth. Small doses increase arterial tension, large ones diminish it. The respiratory movements are accelerated by small doses, but decreased by large ones.

Fifth. Small doses of the drug diminish the excretion of nitrogenous materials, or, in other words, tissue waste is decreased, the urea being decreased from twenty-six to seventeen grammes.

Sixth. Digitalis augments diuresis. When in large doses, it produces an increase in the amount of urine secreted.

The important point to recognize is that large doses here spoken of are practically poisonous; the small doses are the ones which are generally employed in medicine.

If the patient should suffer from tachycardia, with an extraordinary diminution of arterial tension, it is considered wise by Robin to associate ergotin with the digitalis, which has a direct action upon the muscles in the walls of the arteries and veins. For this reason he considers it wise to employ the following prescription:

℞ Powdered digitalis, gr. x;
Water, ℥vi. M.

Sig.—Macerate and add Bonjean's ergotine, 30 grains; iodide of potassium, 1½ drachms; syrup, 7 drachms. To be taken in the course of six days.

At the same time the patient is to take nothing but a pure milk diet, and the milk should be skimmed.

In a case in which there was asystole, with orthopnœa and œdema, and in which there were no traces of albumin in the urine, small doses of caffeine were administered, and the following prescription given:

℞ Milk-sugar, ℥iss;
Acetate of potassium, gr. xv;
Iodide of potassium, gr. xv;
Water, Oii. M.

Sig.—This is to be taken each day.

—*L'Union Médicale*, No. 10, 1892.

THE TREATMENT OF THE SEQUELÆ OF INFLUENZA.

GENDRE recommends the employment of the following prescriptions in the treatment of the conditions following grippe. For the bron-

chitis, which is frequently persistent, he gives the following:

℞ Terpine,
Balsam of tolu, aa ʒii. M.
Sig.—Make into eighty pills, take six or eight a day at equal intervals.

Or the following may be given:

℞ Syrup of turpentine, ʒvi;
Syrup of tolu, ℥iii. M.
Sig.—Four dessertspoonfuls of this may be taken a day.

Where terebinthinates are indicated, the following prescription is useful:

℞ Turpentine, ♏xxx;
Tar, ♏xxx;
Balsam of tolu, ʒiss;
Benzoate of sodium, q.s. M.
Sig.—Make eighty pills, eight of which are to be taken each day. For the nervous depression which frequently follows influenza.

The best treatment, in Gendre's opinion, is full doses of strychnine with soluble phosphates and quinine. He prescribes one-tenth of a grain of strychnine a day, and directs that the following prescription shall be taken:

℞ Phosphate of sodium,
Phosphate of potassium, aa ʒvi;
Syrup of quinine, ℥vii;
Red wine, a sufficient quantity to make one quart. M.
Sig.—A wineglassful is to be taken after each meal.

Frequently, too, it will be found that it is advantageous to use gentle frictions with a glove or a cloth, with the following mixture:

℞ Oil of turpentine, ʒvi;
Spirits of camphor,
Spirits of lavender, aa ℥iss.

In the treatment of the ordinary cases of bronchial inflammation, Marrotte employs full doses of the chloride of ammonium in capsules, or where he is afraid of disordering the stomach, he gives it in the following formula:

℞ Syrup of orange, ℥iss;
Rum, ʒiv;
Infusion of sage, q.s. M.
Sig.—To make a mixture of eight ounces. In this dissolve 45 grains of chloride of ammonium, and give a dessertspoonful every two or three hours. This dose may be increased if the case requires it.

—*Journal de Médecin et de Chirurgie.*

MODIFIED METHODS OF MASTOID TREPHINING.

In his report upon forty-seven cases of operation upon the mastoid, read at the Washington Congress, and published in the *New York Medical Record* of January 2, DR. GRUENING refers to the increased frequency of such cases since the prevalence of the influenza, and describes a modification of the usual procedure which he has recently employed with advantage. After making the usual incision through the soft tissues, and entering the bone with the sharp spoon at any softened point,—or with the chisel behind the *spina cupra meatum* if the surface be firm,—he removes the entire cortex of the mastoid with a small rongeur, spoons out any carious bone or granulations thus revealed, and is able to determine the condition of the entire region, to locate and avoid the lateral sinus, and to reach the antrum with certainty and safety. The wound was generally packed with antiseptic gauze, and healing secured in an average of four weeks, with rare changes of dressing and no syringing. Later he closed the wound entirely, with improved results, healing having occurred uninterruptedly, with prompt cessation of suppuration. He obtained early and good cure in the forty-one acute cases; healing with gain in the three cases with cholesteatoma; but lost three cases which were already pyæmic and with brain-abscess or sinus-empyema at admission.

In the December *Archiv für Ohrenheilkunde*, PANSE gives, in his report of the Halle Ear Clinic for the previous year, details as to the sixty-seven mastoid operations among the sixteen hundred and five patients. Most were done in the usual method of Schwartze; but the later cases, to the number of about a dozen, were done with Stacke's method of dissecting off the auricle and soft tissues of the canal and laying them forward, chiselling away the posterior bony wall and anterior wall of the attic, so as to throw meatus, attic, antrum, and tympanum proper into one open and visible cavity, then replacing the soft parts, and transplanting a flap of canal-lining into the antrum. No opinion is expressed as to the value of the method, because of the limited number of cases; but it has evidently been sufficiently pleasing to claim further trial, and the details of some instances show results as favorable as those obtained by Stacke himself. Certainly every aural surgeon has had reason to grow weary of the slow progress of most cases of mastoid opening, where drainage only is sought by the operation, and the completion of the treatment left to time and the syringe. In these methods radical removal of all diseased structures is attempted, yet in such open manner as to rob the operation of many of its gravest dangers; important structures can

be more surely avoided, healing is likely to be greatly expedited, and the recovery should be secured with a condition far less likely to relapse into cholesteatomatous or other renewed troubles. Stacke's operation was proposed as a modification of Schwartze's method of excising the drum-head and ossicles in case of persistent attic suppuration. Useful as that operation doubtless is in some cases where the caries is almost or entirely limited to the ossicles, there are numerous cases where it hardly alleviates the condition or opens it to more satisfactory drainage or treatment; and in these the needed curetting of the carious bone or the chiselling away of the upper and posterior portions of the meatus is precarious and difficult through the narrow canal, and may require to be supplemented by mastoid trephining. Laying the soft tissues forward, as in the operation for removing impacted foreign bodies from the tympanum, at once opens the whole middle ear to easy access. The excision can be done with facility and precision, any other carious bone can be thoroughly removed, and tympanum, mastoid, and meatus thrown into one open cavity, if required. In replacing the soft parts, the covering of the mastoid cavity by healthy skin can be secured by the transplantation of the lining of the meatus and the danger of cholesteatoma thus reduced or obviated; while suturing of the external wound is generally followed by prompt and perfect healing, without deformity or stenosis.

In this connection it is noteworthy that, while the avoidance of the lateral sinus is one of the prime indications of the usual operation,—difficult because of the irregularities of its position, yet important because the great hemorrhage on opening it, though perhaps causing no serious symptoms, generally puts an end to the operation,—there are yet cases where the suggestion of Zaufal has been carried out, and it has been purposely laid open. A series of such cases of septic thrombosis of the lateral sinus have now been reported from the clinics of Billroth, Keen, and others, where the sinus has been freely laid bare, and, in the absence of pulsation, has been laid open, its purulent and often horribly fetid contents scraped out as extensively as possible, and tamponing used to control bleeding. The profoundly pyæmic condition of the patients has been generally improved; and, although the cases of recovery are as yet but few, each operation is justly to be regarded as an actual life-saving measure, and a brilliant result of bold surgery.

OPERATIVE TREATMENT TO INDUCE QUICK HEALING OF DACRYOCYSTITIS.

GUAITA (*Centralblatt f. Prakt. Augenheilk.*, January, 1892) describes an operation which he practises for the cure of dacryocystitis, which is essentially as follows: Curetting of the lachrymal sac, and the introduction of a canula composed of decalcified bone into the lachrymal canal, which previously has been widened by an incision.

The curetting cleans the inner surface of the lachrymal sac, removes the swollen and diseased portion of the mucous membrane, and, if the bony portion is diseased, the carious spots. The important part of the operation is the curetting. The canula hastens the healing because it permits drainage and also the closure of the cutaneous wound. The canulas are obtained, of various sizes, from the bones of the posterior extremities of large frogs. The bones are decalcified by placing them in a five per cent. solution of hydrochloric acid. The thickest portion of the articulation is so incised that a cartilaginous knob remains at the upper end which secures the canula and prevents it from slipping through the lachrymal canal. The inferior extremity over the articular end is cut into, and by means of forceps and a Bowman's sound, the marrow canal is cleaned. Finally the bone is placed in absolute alcohol, and then in sublimate solution 2–1000.

The instruments required for the operation are a small knife, a Bowman's sound, a Stilling's stricture-knife, two small Volkmann's curettes, Weber's conical sounds, canulas of decalcified bone, forceps, and needles.

The operator cuts directly into the lachrymal sac, exactly as if he were about to perform the operation of cauterization. If there is a fistula, this may be included in the incision and the mouth of it excised. A sound is then introduced into the lachrymal canal in order to ascertain its condition, and a free incision of the stricture is made. The entire cavity of the lachrymal tumor is then curetted, and if there is any disease of the periosteum, this must also be removed. The cavity is cleaned with charpie which has been dipped in a sublimate solution, 1–2000. The canula of decalcified bone is then put into position with the help of a conical Weber's sound, which is thrust into its lumen. Great care must be taken that the canula goes directly into the canal and does not fold upon itself. Having put it in place, the sound is withdrawn without disturbing the position of the canula. The cavity is carefully cleansed and the wound closed with several stitches. Compresses soaked in ice-cold subli-

mate solution are then placed over the area. There is no great reaction, and cure may be expected in from four to six days.

In cases, however, in which there is much suppuration, so rapid a result is not to be anticipated. It is impossible to secure an aseptic surface, and consequently Guaita divides his operation into two parts: First he makes an incision and carefully curettes the cavity, tampons with iodoform gauze, and orders compresses of sublimate solution. Four days later, when the severe inflammatory symptoms have subsided, he incises the stricture, repeats the curetting, introduces the canula, and closes the wound. In these cases he expects healing in about ten days. According to some experiments which he has made, he believes that the decalcified bone is absorbed.

In five months he has performed three hundred and fourteen operations, in all cases with a good result, and he has reason to believe that the ultimate effect is a good one, and that his operation is a radical method.

THE SURGICAL TREATMENT OF GRANULAR LIDS.

DARIER, the chief of Abadie's Clinic in Paris, contributes an article in the *Archiv. d'Ophthalmologie*, February, 1892, concerning the treatment of granular lids, which has been found efficacious in this service. The following points are insisted upon:

(1) Anæsthesia with chloroform is indispensable in nearly every case. (2) One of the most important conditions for the success of the operation is the complete eversion of the eyelids by means of special forceps, so that all points of the conjunctival cul-de-sac may be laid bare and submitted to grattage. (3) In order to attain this object it is very often necessary to enlarge the palpebral slit by incising the outer canthus and thus facilitating the exposure of every portion of the conjunctival cul-de-sac which is in the least affected with granular infiltration. (4) Scarifications are performed with the object of making the contents of the granulations apparent with the least destruction of the conjunctiva. (5) By means of a sharp scraper, and then of a brush composed of short, hard hairs, all the morbid tissue is scraped and brushed as completely as possible. (6) An energetic and painstaking cleansing of the surfaces with a plug of cotton dipped in a sublimate solution, 1–500, ends the operation.

During the first day, iced compresses are applied and frequent lotions of sublimate solution, 1–2000. The patients should be examined daily, the eyelids everted, any sloughs detached, and the whole surface thoroughly cleansed with the sublimate solution, 1–500. At the end of fifteen days the conjunctiva presents a smooth, though somewhat tumefied, appearance, but granulations are invisible and there is no longer any secretion. In the event of previous pannus, or other corneal complication, the improvement, dating from the first day of the operation, is stated to be surprising, and in the judgment of the reporter there is no treatment which has given such good results in so short a time. He attaches great importance to the regular use of a strong solution of sublimate, and recommends that the patients be watched for a month or two after the operation, and prompt interference be undertaken in case the smallest trace of the former disease should reappear.

A NEW ARTIFICIAL EYEBALL.

Referring to the operation of Mr. MULES, of Manchester, which consists in cutting out the cornea so as to obtain a circular opening, making short, lateral, horizontal cuts in the sclera in order to convert the circular into a button-shaped opening, eviscerating the contents of the eye, leaving only the sclera, and finally putting a hollow glass globe into the empty sclera and stitching down the anterior opening on the globe, Dr. W. Charnley (*Birmingham Medical Review*, January, 1892) contributes his experience with the procedure.

After he had performed this operation for some time, he abandoned it on account of the pain and fever which it had caused and the large percentage of failures from the stitches giving way. Recently he has returned to it, and, having made several modifications, is so pleased with his success that he performs it in every case which is deemed suitable.

The following are his steps: He uses corrosive sublimate lotion (1 to 5000) for irrigation during the operation, and dresses with sal alembroth wool and gauze. The instruments and the hands of the nurses and surgeons are carefully asepticized with carbolic acid. The cornea is cleanly separated from the sclerotic by a sharp Beer's knife; then a lateral opening is made with scissors on each side, so that a button-shaped opening is obtained. All the contents of the sclera are then cleaned out with a Mules's scoop; pledgets of cotton-wool are put into the cavity of the sclera and pressure is used until all bleeding stops and the sclerotic is seen to be quite white. Sutures are then put in through the sclera and drawn together and

the dressing applied. Twenty-four hours after the operation there is much chemosis of the conjunctiva and redness and swelling of the lids. This gradually subsides in a few days.

In one case the wound failed to completely unite, the corneal stitches gave way, and the wound gaped circularly to about the size of a normal cornea. The glass ball remained *in situ*, shining through the opening. The eye gradually grew quiet, and the patient had an artificial eyeball without the use of an artificial eye, —that is, an enamelled shell. This accident led Dr. Charnley to attempt the same result by not uniting the margins of the cornea at all, but simply stitching the scleral wounds together. It has now occurred to him to imitate the cornea and iris by having a representation of them painted upon the glass ball. In order to avoid malposition of the painted part of the glass ball, he has adopted a suggestion of Mr. Lawson Tait, to have balls of glass made upon which a raised edge is blown which fits into the corneal opening. Charnley is not in a position yet to state what his success has been, but adds a postscript to his paper describing an improvement which he thinks is a useful one,—namely: The glass balls are blown as usual, and on them is fixed by cement a plate of enamel of the width and thickness of the cornea, having on it a representation of the iris and pupil. This plate fits into the opening at the anterior pole of the sclera, and so keeps the glass globe from rotating.

THE TREATMENT OF RETINAL DETACHMENT WITH SCHOELER'S METHOD.

WICHERKIEWICZ (abstract in *Centralblatt f. Prakt. Augenheilk.*, January, 1892) details the results which he has had in six cases of spontaneous retinal detachment treated by Schoeler's method,—namely, the injection of several drops of tincture of iodine, to produce adhesive inflammation. Each case resulted unfavorably. There was widespread inflammation of the uveal tract, opacity of the lens and of the anterior layers of the vitreous, and the final result was the loss of the remains of the former visual acuity.

THE TREATMENT OF EPITHELIOMA OF THE EYELIDS WITH INJECTIONS.

ROSSANDER (*Nordiskt Medicinskt Arkiv*, vol. xxiii., page 1) reports four observations upon epithelioma of the eyelids and face which he treated with repeated injections of potassium hydrate, one-half to one per cent. Injections of one-half of a Pravaz syringeful, or of a whole syringeful, are made at five or six points at one time, and are repeated every two or three days. The injections are inserted around and below the tumor. The results have been satisfactory, but as the first attempts date only to 1888, the author himself acknowledges that sufficient time has not elapsed to allow a definite opinion to be expressed in regard to the value of his method.—*Revue Générale d'Ophthalmologie*, January, 1892.

SUB-CONJUNCTIVAL INJECTIONS OF SUBLIMATE SOLUTION IN SYPHILITIC IRIDO-CHOROIDITIS.

DR. FELIX LAGRANGE (*Recueil d'Ophthalmologie*, January, 1892) describes a case of syphilitic irido choroiditis in which improvement had failed to occur under the influence of the usual treatment with mercurial inunctions and iodide of potassium, and in which the visual acuity had declined to one-seventh, successfully treated by means of sub-conjunctival sublimate injections.

The first injection was made on the 26th of September, of a strength of 1–1000, beneath the bulbar conjunctiva, in such a manner as to carry the liquid as far as possible into Tenon's space. The needle of a Pravaz syringe was directed close to the sclera between the straight muscles and its point inserted behind the equator of the eye. In this manner four punctures were made in each eye, and in each of them a drop of the liquid was injected. The next day there was scarcely any inflammatory reaction. On the 4th of October the visual acuteness had improved, and the patient could read one additional line of Snellen's types. Another injection was made, this time eight drops of the liquid previously used being employed, and in the same manner. The visual acuteness continued to improve and now reached one-third of normal, while the ophthalmoscopic examination revealed great improvement in the opacity of the media, especially the vitreous. On the 12th of October twelve drops of the solution were injected. Following this there was some acute pain and chemosis, which soon subsided. The visual acuteness, however, did not improve, but by the 20th of October the patient was sufficiently well to return to his work.

Lagrange argues that the patient owes the preservation of his visual acuity to the sub-conjunctival injections, because mercurial inunctions had twice induced salivation without improving the irido-choroiditis, and iodide of

potassium had not been more efficacious. Referring to the dosage which was employed, and to the previous observations of Darier, that the quantity of solution that may be injected each time varies from one or two divisions of a Pravaz syringe,—that is, one-twentieth or one-tenth of a cubic centimetre,—Lagrange considers this a weak dose. He points out that in his own case, as well as in others, he has injected twelve divisions of the syringe around each eye. Five or six drops of a sublimate solution, 1–1000, represents a moderate dose capable of furnishing very useful results without inconvenience.

PROPHYLAXIS OF OPHTHALMIA NEONATORUM.

VALUDE (abstract *Revue Générale d'Ophthalmologie*, January, 1892) recommends the use of finely-powdered iodoform in the following manner: From the moment of birth, and before the cord is severed, the eyelids of the child should be gently rubbed with a tampon of cotton saturated in an antiseptic solution. The eyelids should then be separated and a quantity of finely-pulverized iodoform blown upon the conjunctiva. It is not necessary to renew the insufflation. With this practice, there were five ophthalmias among two hundred and forty-eight children,—that is, about two per cent.

THE ABUSE OF MERCURY IN THE TREATMENT OF DISEASES OF THE EYE.

LANDOLT (Acad. de Méd., January, 1892, abstract in the *Archiv. d'Ophthalmologie*, February, 1892), while perfectly willing to pay tribute to the important value of mercury in the treatment of numerous ocular manifestations of syphilis, protests against the abuse which is made of this drug in incurable affections, or in those indicating at the same time other rational and efficacious treatment. For example, when mercury can have no influence on the atrophied fibres of the optic nerve, or on a detached retina, it may be prejudicial to the general health of the patient suffering with these lesions. Mercurial treatment, by its deleterious effect on the organism, may deprive the physician of a most powerful ally, —the curative action of a good constitution. Doctor as well as patient may become the victim of a species of auto-suggestion. Without sufficient reason the physician is absolutely convinced of the efficiency of a remedy, and considers it a serious fault if he does not administer it. So far as this belief is concerned, with inoffensive substances it is not prejudicial to the patient, and may even contribute to his recovery if the suggestion is communicated to him. When, however, we deal with a medicine as energetic as mercury, the problematical effect of the suggestion is paid for too dearly. Landolt cites observations upon serious ocular affections amenable, according to current opinion, to a mercurial treatment, which, nevertheless, were perfectly cured by the judicious use of simple remedies and appropriate hygiene.

INCISION OF THE ANGLE OF THE IRIS IN THE TREATMENT OF GLAUCOMA.

UGO TAILOR (abstract by Malgat in the *Recueil d'Ophthalmologie*, January, 1892) extols an operation which he calls incision of the angle of the iris, applicable to the treatment of glaucoma. To perform this operation, the author uses a sort of cataract-needle, pointed and sharp on its convex side. The instrument is thrust into the anterior chamber traversing the sclerotic obliquely a millimetre and a half from the periphery of the cornea, at a point corresponding to the horizontal meridian. Then the instrument is thrust in a parallel direction to the anterior plane of the iris until it reaches the angle of the iris upon the opposite side. At this moment the sclerotic must be cut with the edge of the instrument, which is then withdrawn and a solution of eserine injected. Dr. Tailor reports eight observations with good results. In certain cases of decided glaucoma he prefers iridectomy and ordinary sclerotomy. He suggests that it would be proper to experiment with incision of the angle of the iris in cases of glaucoma following serous choroiditis and anterior sclero-choroiditis, and in buphthalmos.

OPERATION ON MICROPHTHALMIC EYES.

H. LINDO FERGUSON (*The Ophthalmic Review*, February, 1892), in an interesting paper on microphthalmic eyes, describes some results which he has had in improving the vision under such circumstances.

In one case, a woman aged 42, the vision of the left eye had been lost on account of glaucoma, in spite of a successful iridectomy. The vision of the right eye was fingers at four meters, and she was wearing a convex lens of 5 D, with which she could decipher words of J. 8 at about three inches from the eye. The tension was normal. The optic disk seemed to be natural, but intensely red. The refraction is stated to have been +27 D, and with this lens she

could count fingers at 6 metres, but was not able to bear a lens stronger than +14 D, because of the intense dazzling. About two years later this glass was strengthened to 18 D. The patient was quite comfortable with this. She could see $\frac{6}{60}$ and read words at J. 1 at three and one-half inches. The reporter hopes that he may be able to give a still more ample correction later on, and lessen the danger to strain of accommodation and the production of glaucoma. The corneal measurements were as follows: The horizontal measurement was just 10 millimetres in each eye, while the vertical axis of the cornea was about .5 millimetre less.

The second case was a child in whom shortly after birth it was noticed that the eyes were small and the sight defective. When two years old it was found that the irides were firmly bound by adhesion to opaque lenses. Atropine treatment failed. When Ferguson saw the case, in November, 1885, the pupils were only pin-hole and the margins of the iris attached firmly to the opaque lenses. Sight equalled the power to follow the flame of a candle. In January of the following year, as nystagmus had considerably increased, an iridectomy inward was attempted on the left eye, but succeeded only in tearing away a small portion of the iris tissue. An anterior synechia formed at the site of the incision. Two weeks later an iridectomy was made outward and the synechia was cut. He also did an iridectomy inward on the right eye up to the margin of the cornea. The left eye healed with an anterior synechia at the site of the incision, but in the right eye a clean iridectomy was obtained. Nystagmus was considerably lessened by the operations. In January, 1891, with the right eye, the patient counted fingers at .6 metre; with the left eye, fingers at .75 metre. The cataract of the right eye was then needled. There was no reaction, the opacity was chiefly capsular, and by the 5th of the following month, fingers could be counted at 1.75 metres. On February 9 the remains of the capsule were removed through a small corneal incision. On the 26th, vision equalled fingers at 3 metres, improved by the use of a 10 D lens. The optic nerve was now visible, and was much atrophied. On March 3 the capsule of the left eye was cut with De Wecker's scissors, and by March 20, with +13 D, vision equalled fingers at 2.25 metres. The nystagmus had now ceased and the horizontal diameter of the corneas was just a shade under 9 millimetres. It was extremely difficult in this case to test the vision; but three months later, while the child was wearing the convex 13, the father reported that a great improvement had taken place in her sight, that she was able to discern objects that had never been noticed before.

Mr. Ferguson reports these cases in the hope that they may bring out the experience of other ophthalmic surgeons. He refers to two interesting points,—the occurrence of glaucoma in an eye with a 10-millimetre cornea, and the fact that defective development of an eye does not prevent its being successfully operated upon if the necessity arises.

PARAPERITONEAL NEPHRECTOMY.

RIVIÈRE (*Lyon Medical*, 24 an., tome lxix.) reports a case of abdominal nephrectomy practised upon a patient 25 years old, who suffered from frequency of urination and from attacks of kidney colic, followed by constant pain and a tender swelling in the right lumbar region. A diagnosis of calculous pyelo-nephritis was made. The kidney was exposed by carrying a cut from the outer extremity of the false ribs to about one inch external to the outer border of the latissimus dorsi muscle. The three layers of abdominal muscles were divided. This brought the operator to the portion of the peritoneum which is not tightly adherent and which can readily be stripped up backward until the kidney is exposed. The kidney was found to be distinctly tubercular. Its pedicle was ligated *en masse* and the organ was removed.

The operator claims for this incision ready and safe access to the kidney and plenty of room for the removal of a greatly enlarged organ.

SYMPHYSIOTOMY.

Since BOUDELOCQUE characterized symphysiotomy as an operation which killed the mother when it saved the child, killed the child when it saved the mother, or when both survived was unnecessary, this method of procuring more room in cases of narrowing of the parturient canal has not received popular favor. Recenty, however, Morisani and Spinelli have published excellent results from this operation, and Pinard (*Annal de Gynécologie et de Obstétrique*, tome xxxvii., February, 1892) announces that it is a method which will, to a great extent, supersede embryotomy and Cæsarean section. He entered into an experimental investigation to determine whether symphysiotomy is able notably to increase the diameters of the pelvic outlet without occasioning serious lesion. That

this is the case, clinical and post-mortem evidence proves conclusively.

A question of cardinal importance to be considered is as to whether the operation is one which can be safely performed by the ordinary practitioner. On this point, too, Pinard is positive that the technique is so simple that any one thoroughly conversant with antiseptic principles can apply it. The third point to be considered in judging of the value of the operation is as to whether the subsequent union of the divided symphysis takes place rapidly without occasioning any disability. This is settled by the records of cases which prove conclusively that in about a month there is firm union without consequent disability.

Morisani has practised symphysiotomy in twelve cases; all the women and eleven children survived. These results are certainly brilliant enough to justify a trial of the method.

CHOLECYSTENTEROSTOMY.

HELFERICH (*Deut. Med. Woch.*, No. 8, 1892) gives the history of a successful cholecystenterostomy. The patient, aged 37, was operated on for gall-stone and attendant obstruction. The ductus choledochus was found blocked by stones which could neither be crushed nor removed. The loop of the gut just beneath the duodeno-jejunal fold was drawn out through the abdominal wound, was opened, and its interior thoroughly washed out. It was then secured to the gall-bladder by two rows of silk suture. The operation required in all two hours. The patient recovered almost without interruption, and two months later was in good health.

ELECTRICITY IN THE TREATMENT OF EPIDIDYMITIS.

LYDSTON (*North American Practitioner*, vol. iv., No. 2), in commenting upon the treatment of epididymitis, believes that the absorption of the inflammatory exudate is often promoted by the administration of chloride of ammonium. By far the best local measure is, however, the application of faradism and pressure. The simplest and best application of this method is by means of the thumb and fingers; employing the current in this manner it is unnecessary to faradize the body of the testes. Moderate pressure should be made simultaneously with the passage of the current; the best results are obtained from the application of the negative pole. Where there is great tenderness or hypersensitiveness, it is well to apply the current through the medium of a local warm bath. Daily treatments should be given with a current of moderate strength. Several weeks of electricity are necessary to obtain complete resolution.

TREATMENT OF GOITRE BY INTERSTITIAL INJECTIONS OF IODINE.

DUGUET (*Journal de Mèdecine et de Chirurgie*, tome lxiv., 4 cahier), who has since 1874 successfully treated many goitres by interstitial injections of iodine, believes that in solid recent goitres, such as are encountered in young subjects, their disappearance is most readily and rapidly effected under this treatment. Recent cystic goitres are cured even more readily than the solid tumors. Goitres which have undergone in places calcareous degeneration or present aneurismal conditions of the vessels give least satisfactory results, though even these undergo decided improvement under injection treatment. The result of this treatment is not the total destruction of the gland, but its progressive atrophy, until it no longer occasions inconvenience by its bulk. Since the gland is not entirely destroyed, the patient cannot be considered beyond the danger of recurrence, and, indeed, in some few cases, this has been noted. The fear of myxœdema, however, need not be entertained.

The injection material employed is the officinal tincture of iodine. This is introduced into the tumor by means of an ordinary hypodermic syringe. The needles should be kept sharp and well-polished. To avoid the corroding effect of the iodine, they are washed in a weak ammoniacal solution and stored in ten per cent. carbolized oil.

Before each injection the goitre is carefully measured. The needle, disconnected from the syringe, is thrust into the body of the goitre, an effort being made to avoid blood-vessels. After its introduction the needle is watched for a few seconds to see if any blood flows out. If blood escapes, it is a certain sign that a blood-vessel has been punctured, and the needle should be at once withdrawn and introduced at another point, since very serious symptoms may arise from throwing the iodine directly into the circulation. If the needle enters a cyst and blood-stained serum exudes, its evacuation may be hastened by means of an aspirating syringe.

When the surgeon has assured himself that the point of the needle is safely placed in the substance of the tumor, the iodine is slowly

injected, from eight to sixteen drops being employed at one time. No dressing is required after these hypodermic punctures. Immediately following the treatment, pains in the ears, torticollis, lassitude, and fever may be noted. These symptoms do not last longer than a day. According to the reaction excited, the treatment is repeated every one or two weeks. Before patients are subjected to the iodine injections the urine is examined. If it is found to contain albumin, this method of treatment is not advised.

TREATMENT OF LUPUS OF THE SKIN.

KRAMER (*Centralblatt für Chirurgie*, No. 8, 1892) is disposed to reject absolutely every treatment directed to the cure of lupus, excepting total excision. He has followed for more than two years ten operative cases treated by the knife, and has in every case secured permanent cure. The disease was located in the face and neck, and the patches varied from the size of a fifty-cent piece to that of the palm of the hand. An anæsthetic was administered in all instances, and the knife was carried two-fifths of an inch from the margins of the diseased patch through healthy skin, superficial and deep fascia. The muscles, and often bones and cartilages were exposed. The wound was closed in some cases by sutures, in others, either by plastic operation or by Thiersch's transplantation method. In every case the wounds ran an aseptic course, and in not a single instance was the scarring very disfiguring.

On the basis of this experience and from observation of many patients, the author concludes that excision is the only method to be considered, because of its simplicity, of its foundation on sound common-sense principles, the relatively short after-treatment required, and because, from a cosmetic point of view, it is preferable.

OPERATIVE TREATMENT OF VOLVULUS OF THE SIGMOID FLEXURE.

BRAUN (*Archiv für Klinische Chirurgie*, 43 Bd., 1 Heft) contributes histories of three cases of volvulus of the sigmoid flexure treated by laparotomy. The first case showed one complete twist with resultant congestion and patches of gangrene. The bowel was untwisted, drawn out from the abdomen, and the entire sigmoid flexure was cut away, the mesocolon being ligatured in four sections. An artificial anus was formed, the divided ends of the bowel being brought out side by side. Nearly yard of gut was removed. The patient made a good recovery.

The second case showed a complete twist,—that is, of three hundred and sixty degrees. The bowel was untwisted and was so secured by sutures that a recurrence of the malposition was impossible. The patient made a rapid recovery.

The third case exhibited symptoms of intestinal obstruction without any signs distinctly characteristic of volvulus. An incision was made in the right inguinal region and colotomy was performed. Considerable bloody serum escaped from the peritoneal cavity. A greatly distended loop of bowel now being felt by abdominal palpation, a second laparotomy was performed in the linea alba. From this incision a large amount of bloody serum again escaped. The sigmoid flexure was found twisted one hundred and eighty degrees about its axis. Immediately on being untwisted, the distended loop collapsed, and a large amount of gas and fæces escaped through a tube placed in the anus. In two places there were patches of gangrene with perforation of the bowel. The two points of perforation were closed by suture and the application of an epiploic appendage. Death followed in five hours.

The diagnostic points of volvulus, namely, the fact that it occurs in middle-aged or old men of constipated habit, that frequently the markedly distended flexure can be detected on abdominal palpation, and that there is usually a collection of fluid in the peritoneal cavity, easily demonstrable on percussion, are considered. The palliative treatment is carefully considered, and valuable statistics upon the results of operative treatment are collected. The author finds that in seventeen cases in which, on abdominal section, untwisting was possible, six, or thirty-five per cent., recovered. The fatal cases were due mainly to collapse and peritonitis.

In two cases successfully treated by laparotomy and untwisting, the volvulus recurred some months later. Of four cases in which it was found impossible to untwist after the laparotomy, all died.

Of two cases treated by laparotomy and resection of the twist, one perished thirty-two days after operation from perforating gastric ulcer, the other recovered.

Eight cases treated by enterotomy died.

The author concludes his study of this subject by stating that early resort to operative procedures would save many of the cases that now perish because of valuable time lost in futile efforts at cure by other means.

REMOVAL OF AN OMENTAL ECHINOCOCCUS CYST.

MUELLER (*Australasian Medical Gazette*, vol. ii., No. 4) reports a case of echinococcus cyst of the omentum cured by operation. This cyst formed a tumor the size of an emu egg. The belly was opened. The cyst was secured to the edges of the parietal wound, was incised, and its lining membrane was readily drawn out. The boy was walking about in ten days.

THE CURE OF TRAUMATIC ILIO-FEMORAL ANEURISM BY OPERATION.

In the *Australasian Medical Gazette* (vol. ii., No. 4, 1892), MACCORMICK reports a case of leaking traumatic ilio-femoral aneurism. The aneurism formed a tumor in the left groin the size of the fist. As it was increasing rapidly in size, the ordinary incision for ligation of the external iliac artery was made and a ligature was applied to this vessel. The sac of the aneurism was then opened, its contents were turned out, ligatures were applied above and below the openings into the sac, and as much of the latter as possible was cut away. The patient made a happy recovery with no symptoms of threatening gangrene.

THE VALUE AND APPLICATION OF THE CYSTOSCOPE.

MEYER (*New York Medical Journal*, vol. lv., No. 7) comes to the following conclusions as to the value and application of the cystoscope:

1. In all obscure reno-bladder diseases cystoscopy has to be practised—if necessary, repeatedly—before operative interference for diagnostic purposes is resorted to.

2. There are a number of causes which make cystoscopy impracticable.

3. Cystoscopy is an easy and harmless examination, but its successful employment requires experience.

4. It should be performed as a *dernier ressort*, after all other well-known means for making a diagnosis have been exhausted.

5. If properly applied, cystoscopy will generally clear up an obscure disease of the bladder.

6. In most cases we can determine, with the help of electric illumination of the bladder, whether we have to deal with a disease of the bladder or of the kidneys.

7. We can thus find out whether there are two working kidneys, also whether only one of the two kidneys is diseased or both.

8. We shall most probably soon be able, perhaps in the greatest majority of cases, after sufficient practical experience and with the help of proper cystoscopic instruments designed for this purpose, to catheterize the ureters, and thus gather, in a bloodless manner, the urine from each kidney separately.

9. We can thus make out, in certain cases, by observing *the character* of the jets of urine, especially by *timing their frequency and duration* at the urethral orifices, whether the other kidney is doing the work for the one which is diseased.

10. These facts will tend to make superfluous, in the majority of cases at least, a preliminary suprapubic or perineal incision for diagnostic purposes, as well as a nephrotomy performed for determining the action of the other (not diseased) kidney. They greatly widen and strengthen our means for determining the indication and prognosis of nephrectomy.

11. With the aid of Nitze's newest instrument, the operating cystoscope, we may look forward to being able to carry on intravesical treatment under the direct guidance of our eyes.

ANTERIOR ABDOMINAL HYSTEROPEXY.

By this term is meant opening of the abdominal cavity and suturing the fundus of the uterus to the anterior abdominal walls. The operation was first practised by KOEBERLE, in 1869. It is, of course, especially applicable to backward deviations of the uterus.

If, on exploratory laparotomy, the case is found suitable for this operation, three silk fixation sutures are placed. These include all the thicknesses of the abdominal wall except the skin and subcutaneous fascia. They enter at one side of the wound, include a certain thickness of the uterine tissue, and are passed through the opposite side. The lower suture is placed at about the point of junction of the neck and body of the womb, the upper at the upper portion of the fundus. The fixation threads in the uterus are then knotted, and the abdominal incision is closed.

After a careful consideration of the question as to whether this operation is justifiable, Mercier (*L'Union Médicale du Canada*, vol. vi., No. 2) concludes that hysteropexy should always be performed if in the course of an operation undertaken for another purpose indications for this procedure are found. Laparotomy for the sole purpose of fixing the womb is justifiable in marked cases of retrodeviation, since this method not only provides a certain cure, but if practised under proper precautions is attended by no risk.

THE TREATMENT OF PRURIGO AND PRURITUS.

BARJON (*Journal de Mèdecine et de Chirurgie*, tome lxiii., 4 cahier), in a thesis upon the treatment of prurigo and pruritus, limits the first term to the affection characterized by the presence of papules, while pruritus designates cutaneous hyperæsthesia without appreciable lesion. Treatment must first be directed to the cause of the trouble. Yet even if this is discovered and remedied, itching may still continue. This is sometimes noticed in parasitic diseases, the symptoms persisting for several months after the entire cure of the original lesion. Diabetes, deficient renal action, ptomaïne absorption from the alimentary tract, and affections of the nervous system, all must be considered in searching for the cause of itching.

Among the medicines which are found useful are the following: Extract of valerian, in doses of from 15 grains to a drachm; valerianate of zinc, 1 to 3 grains; powdered belladonna leaves, or extract of belladonna, from ⅙ grain to 1½ grains; tincture of belladonna, 2 to 8 drops; daturia, in appropriate doses; carbolic acid, from 8 to 16 grains, given in pill form, and followed immediately by copious libation to prevent irritating action; or carbolic acid may be administered in the following combination; carbolic acid, ½ to 2 grains; calcined magnesia and extract of valerian, each 2 grains, made into one pill; arsenious acid or arseniate of sodium may be administered.

These drugs should be given, commencing first with small doses, and pushing the medicine until the point of toleration is reached. Antipyrin, salicylate of sodium, sulphate and valerianate of atropine, cyanide of potassium, all are drugs which, in individual cases, have served useful purposes.

Morphine, bromide of potassium, and chloral should be interdicted, since all these drugs give but temporary relief, and are liable to increase the itching.

In so far as external applications are concerned, baths, particularly those of sulphur, often aggravate the condition. Warm vapor-baths or shower-baths, the temperature of the water being slightly moderated, are better. A general starch-bath, in which the patient is plunged for fifteen minutes, is sometimes serviceable; a quart of vinegar can be added to this bath. Lotions of hot water may be employed, to which may be added any of the following medications: Carbolic acid, 1½ to 3 drachms to the quart; chloral, 1½ to 8 drachms to the quart; bichloride of mercury, 15 to 30 grains to the quart; vinegar, 2 ounces to the quart; camphorated alcohol, 1 to 2 parts of water; hydrocyanic acid solution, 1 to 2 drachms to the quart; infusion of cocoa, or infusion of tobacco leaves, ½ to 1½ drachms to the quart. Rain-water should be used for these lotions.

After the application of these solutions either a vegetable or mineral dusting-powder should be used upon the affected parts, or a pomade should be applied.

Dusting-powders are made up of a mixture of starch with bismuth, or oxide of zinc or salicylic acid. The two former ingredients form from five to twenty five per cent. of the powder. The salicylic acid forms from one to three per cent.

Excellent pomades are made by taking as a basis equal parts of vaseline and oxide of zinc. To this paste may be added one of the following ingredients in the proportions named: Menthol, 1 to 100; carbolic acid, 5 to 100; salicylic acid, 5 to 100; salol, 5 to 100; naphthol, 15 to 100.

A useful prescription is the following: Tartaric acid, 2 parts; carbolic acid, 1 part; essence of peppermint, 1 part; lard, 60 parts.

The affected surface is smeared lightly with one of these ointments, and is then powdered. The strength of the various applications can be progressively increased. The dressing should be renewed each time the pruritus again becomes distressing.

Plasters are often useful. Of these, the best are made of cod-liver oil, to which is added carbolic acid or naphthol. Plasters of resorcin, of ichthyol, and oxide of zinc are also to be commended. If the pruritus is purely local, as about the anus, scrotum, or vulva, ignipuncture and linear scarifications will sometimes accomplish a cure.

Of all external treatment, without doubt the most successful is that of shutting off the affected area from the air. According to Tenneson, this will cure nine out of ten cases. The whole surface attacked with pruritus or prurigo is covered in with a dressing of caoutchouc or other impermeable substance. Under the influence of this investment cutaneous reflexes are shortly abolished. The dressing is continued as long as the itching recurs on its removal.

Unna's glue, supplemented by some of the dusting-powders, forms an excellent impermeable coating. This glue is made up of gelatin, glycerin, and oxide of zinc.

Reviews.

RECENT MATERIA MEDICA, WITH NOTES ON THEIR ORIGIN AND THERAPEUTICS. Fourth edition. By F. Harwood Lescher, F.C.S.
London, England: J. & A. Churchill, 1891.

Mr. Lescher's book must prove a very valuable one to the physician who wishes to keep abreast with the latest medicaments which have been brought forward in this country or abroad. While in a number of instances remedies are considered which are familiar, the book generally treats of those which have been found of value by a limited number of investigators, and which, for various reasons, have not been thoroughly tried by the mass of the profession. The fact that four editions of the book have been called for within seven years evidences that it is recognized as a useful work by those who are familiar with it. The chemical formula of each drug and its chemical name is given, and after these are considered its physiological characteristics, and its chemical reactions are discussed. The article in each instance is completed by a few lines upon its therapeutics and dosage, which, in many cases, are strengthened by formulæ illustrating the method in which the drug may be employed.

The preparation of the book must have been exceedingly troublesome, and the author deserves credit for the manner in which he has given a large amount of information in a comparatively little space.

By means of an extra printed slip, drugs which have appeared as late as October, 1891, are included in this edition.

A DICTIONARY OF TREATMENT, OR THERAPEUTIC INDEX, INCLUDING MEDICAL AND SURGICAL THERAPEUTICS. By William Whitla, M.D. Revised and adapted to the Pharmacopœia of the United States.
Philadelphia: Lea Brothers & Co., 1892.

Dr. Whitla states in his preface that his first idea was to make this book one of fifty or sixty pages, or, in other words, to dilate upon the therapeutical index to his work upon pharmacy, materia medica, and therapeutics. Instead of this, he has placed before the profession a book of nine hundred and twenty-one pages, which resembles more closely than any other work with which the reviewer is familiar Hartshorn's "Essentials of Practical Medicine," or a similar work published many years ago by Neil and Smith. As with these former works, Dr. Whitla's is published by Lea Brothers & Co., which guarantees that the printing and other work of the publisher has been well done. It is not possible to review and criticise completely a book in which the discussion of so many diseases is included.

Under the study of valvular diseases of the heart, we notice that Dr. Whitla has been particular to refer to the so-called cumulative action of digitalis. He teaches that in pure aortic regurgitation, digitalis is of value, although he is careful to allude to the fact that in many cases it is contraindicated by the prolongation of the diastole which it produces. It is very evident that Dr. Whitla has not written entirely from his own experience, but has labored greatly in the abstraction of practical therapeutic points from other writers, to whom he constantly gives credit. The book seems to us to be one of the best of its class. The only fault to be found with it is that perhaps too much confidence is rested upon empirical facts, and too little endeavor made to put the treatment recommended upon a rational basis. To those who have found the books of Neil and Smith and Hartshorne of value, this work will prove useful. To those who prefer more thorough and complete works, it is hardly necessary to state that they will be disappointed in the necessarily brief statements which are made.

PRACTICAL MIDWIFERY AND HAND-BOOK OF TREATMENT. By Edward Reynolds, M.D. Illustrated.
New York: William Wood & Co., 1892.

It seems to have been our good fortune, in reviewing books for this number of the GAZETTE, to have met with those in which the style is so fluent as to make the labor of the reviewer a pleasure. There is an air about Dr. Reynolds's work which impresses one,—first, with the fact that he knows what he is talking about; and secondly, that an ample experience has shown him the practical as well as the scientific side of obstetrics. In the course of twenty-eight chapters he presents what is, perhaps, the most thorough yet brief consideration of the subject of midwifery with which we are acquainted. One of the points which will strike the under-graduate, or even the practitioner, with the most force, who carefully reads this book, will be the attention to minute detail which is given by the author. In many works this attention results in verbosity, but in this one either brief foot-notes or a single line of text points out to the inexperienced accoucheur some little point, which, while it is comparatively unimportant, from a medical point of view, nevertheless, does much towards increasing the confidence of the patient and

nurse in the obstetric ability of the medical attendant. We are not burdened by the ordinary consideration of embryology, which is so often dragged out through the beginning of the book, but we are taken, step by step, into the depths of obstetrics, so that we find ourselves considering the subject of dystocia with a clear line of thought, concerning pregnancy and normal labor, back of it.

It is unfortunate that the illustrations in some parts of the book are very poor, but all of them which are not clear deal with subjects which do not require very minute detail in illustration.

Altogether this is the best book that we know of to recommend to the student or practitioner who does not wish to descend into the slough of quiz compends or rise to the intellectual heights of Lusk and Parvin's obstetrics.

SYPHILIS IN ANCIENT AND PREHISTORIC TIMES. By Dr. F. Buret. Translated from the French by A. H. Ohmann Dumesnil.

Philadelphia and London: F. A. Davis & Co., 1891.

This scholarly work, admirably translated by Professor Ohmann Dumesnil, is one which will amply repay the time spent in its perusal.

America is finally cleared of the opprobrium of being the birthplace of syphilis. The disease is traced back to the Chinese five thousand years ago, to the Japanese at the beginning of the ninth century, and to the Egyptians at the time of the Pharaohs, fourteen centuries before Christ, and the Hebrews in biblical times. The author shows, to his own complete satisfaction, and to the amusement, if not conviction, of the less reverent of his readers, that King David was afflicted with syphilis, while suspicion is cast upon Job, upon Herod, and upon other biblical characters. The disease is also described in the writings of the Hindoos, a thousand years before Christ; among the Greeks, both before and after Christ; and in Rome under the Cæsars.

This first volume of the series closes with a chapter upon the rational treatment of syphilis in the nineteenth century. The opening sentence of this chapter sufficiently characterizes the author's style: "Syphilis, the daughter of Prostitution, was born as soon as Commerce, chasing Love, presided over the exchange of caresses." The book abounds in quotations and in shrewd comments. Although it may not carry conviction to every mind, it certainly charms and delights, not alone from the "nudity of expressions," but from the evidence shown everywhere of a clear, keen, and scholarly mind."

SURGICAL ANATOMY FOR STUDENTS. By A. Marmaduke.

New York: D. Appleton & Co., 1891.

Considering the number of surgical anatomies presented to the profession by men who have devoted their lives to this subject, another book dealing with kindred topics would seem out of place. The author has, however, in this case endeavored to epitomize the work of larger volumes, to bring out in strong relief the more important anatomical points which have direct surgical bearing, and to present to the student a general *résumé* of the subject upon which he can subsequently hang more detailed knowledge. Hence the book will be found most useful to students, particularly to those who are preparing for practical anatomical and surgical examinations.

It cannot be stated that the author covers his ground any more carefully, or brings out important points any more saliently, than has been done before. In some cases the anatomical descriptions seem somewhat involved; as, for instance, the following sentence, describing the course of the femoral artery: "Flex and abduct the thigh and leg, draw a line along the inner aspect from midway between the anterior superior spine and the symphysis pubis to a point at the junction of the middle of the lower third of the thigh opposite the inner condyle of the femur." The book can scarcely be classed as anything more than a quiz compend, sufficiently accurate in the limited ground which it covers.

PHYSICIAN'S LEISURE LIBRARY SERIES. THE MODERN TREATMENT OF HIP-DISEASE. By C. F. Stillman, M.D.

Detroit, Mich.: George S. Davis, 1891.

The object of this little volume is to lay before the reader as briefly and clearly as possible the most recent views and the most recent treatment of tubercular disease of the hip-joint. The various plans of treatment are carefully discussed, and the methods of the most distinguished orthopædists are given in such detail that any physician gifted even with very moderate mechanical ability can apply the treatment he selects to his own cases. Indeed, this is the feature of the book which gives it peculiar value.

Perhaps the main criticism upon this work would be that the author has made a careful collection of the best treatments, including his own, but has preferred to leave the reader to individual selection rather than guide him by his own wide experience. This is, however, a fault which is easily pardoned.

The book is well worth careful study on the part of the general surgeon, and may prove profitable reading even to the skilled orthopædist.

PHYSICIAN'S LEISURE LIBRARY SERIES. INSOMNIA AND HYPNOTICS. By Germain Sée, M.D. Translated by E. P. Hurd, M.D.
Detroit: George S. Davis, 1891.

The title of the book and the preface of the translator differ somewhat in the idea which they convey to the mind of the reader, for, in the preface, Dr. Hurd states that "this little treatise, though long advertised to be a translation of a recent monograph of Germain Sée, is in reality a product of my own pen, and whatever merit may belong to it, and all the faults and mistakes, must be credited to me." After this, we cannot see where the authorship of Dr. Sée comes in. In the first chapter is considered the physiology of sleep, the necessity of sleep, the functions of the cerebrum, dreams, and the state of the circulation during sleep. The second chapter is devoted to insomnia, both in its psychical and physiological aspects, and the third is consumed in the consideration of the so-called hypnotics and remedial measures addressed to the cure of insomnia. The author seems to have a particular fondness for preparations made by certain manufacturing concerns, and while some may object to the frequent mentioning of particular preparations, after all, the practising physician wishes to know all the minute details connected with the treatment employed by the authors whom he consults. The truest statement in the entire book is one which is on page 81, which the author has italicized. He says, "Chapters on syphilis, rheumatism, gout, and lithæmia, as predisposers of insomnia, were originally drafted, but it was found impossible to include them without making this volume too bulky." A treatise on all the causes of the derangements of sleep would comprehend almost the whole of internal, and even surgical, pathology. Of the one hundred and twelve pages in the book, but twenty-four are devoted to the employment of hypnotics. We are inclined to doubt the statement that opium is still the most universally-employed hypnotic, for, unless pain is present, chloral is certainly the better and more generally-employed remedy for the purpose of producing sleep. The proof-reading of the prescriptions might have been more careful; but, aside from these minor faults, the work will prove useful to the general practitioner, who may seek information as to the best manner of treating some of these troublesome cases.

ARBEITEN DES PHARMAKOLOGISCHEN INSTITUTES ZU DORPAT. Herausgegeben von Professor Dr. R. Kobert.
Kaiserlich Russischem Staatarath.

We have received from the publishing house of Ferdinand Enke, at Stuttgart, the sixth and seventh numbers of the well-known "Arbeiten" of Professor Kobert, containing within their three hundred odd pages researches upon "Saponins and Allied Substances," by Nicolai Kruskal; upon "Agrostemma," by Nicolai Kruskal; upon Basch's "Sphygmomanometers," by Basil Rosen; upon the "Amount of Iron in Urine, both Normal and Pathological," by Nicolai Damaskin; and a series of papers upon the "Absorption and Separation of Iron," by John Kumberg, Chr. Busch, and Eugen Stender, with conclusions drawn from them by Professor Kobert himself; also upon "Oxalic Acid and some of its Derivatives," by Paul Krohl; and upon the "Poisonous Properties of Bile."

Of these papers, the only ones which seem to have close relation with practical medicine are those which are devoted to the physiological study of the iron properties.

The results obtained by the workers upon iron are,—1. That the presence of iron can be demonstrated in normal filtered or unfiltered urine, both quantitatively and qualitatively; and the separation of iron does not cease, as has been affirmed, during fasting in man; and the administration of an officinal preparation of iron does not cause iron to disappear from the urine. 2. The iron exists in the urine in two portions,—one in the morphological elements of the normal and pathological urine, the other dissolved in the urine itself, it being doubtful whether it is or is not simply in the coloring-matter of the urine; but it is certain that this iron in solution is in some very permanent combination, as it resists even heating of the urine with muriatic and nitric acids. 3. The normal relation of the iron in the morphological elements to that in solution appears to be from 1 to 7 to 1 to 8. 4. The daily elimination of iron in the urine is scarcely one milligramme, but is subject to much variation, according to nourishment, etc. In sickness, attended with destruction of the blood, or with increase of the morphological elements of the urine, the elimination of the iron increases, but the presence of

biliary coloring-matter in the urine has no influence upon it. 5. When a citrate of iron and soda is injected subcutaneously into man, in the dose of one milligramme per seven kilogrammes of weight, forty per cent. of the iron escapes in the urine unaltered. Such injections are, however, attended with distinct danger of renal irritation, and hypodermic injections of iron should be given in very minute doses. 6. The administration of the citrate of iron, or of the saccharated carbonate of iron by the mouth, in doses of one hundred milligrammes a day, or the rubbing into the skin of the same preparations, does not perceptibly alter the elimination of iron; so that positive proof is still wanting that this and similar preparations of the Pharmacopœia are taken up by the human organism, although Kunkel reached opposite results upon animals, and although these preparations have been proven to have distinct chalybeate influence. In the Busch experiments, on the contrary, it was found that either pure or impure hæmoglobin, given internally, moderately increased the elimination of iron from the urine.

The results which we have just detailed seem to indicate that the organic preparations of iron are much more valuable than the inorganic; but, on the other hand, it must be remembered that the chemist, in attacking the iron problem, so far has only touched the core of the matter. The real point that the clinician wants to know, is not how much iron is absorbed and runs through the body, but how much is taken into the blood and appropriated by the blood-making organs. It is possible that a preparation A. should be absorbed, refused by the blood, and pass out by the kidneys; while preparation B. should be absorbed, and fail to appear in the organs of elimination, because it is appropriated by the blood. Under such circumstances the second preparation would be much the more valuable, and yet the chemist whose researches were only partial might deny its absorption.

Clinical experience has proved beyond all cavil that these iron preparations are absorbed, and, in the present state of chemical knowledge, it seems to us that the practical doctor must be guided by clinical experience, entirely independent of the scientific researches.

Professor Kobert is a rather slender, moderately tall German, dark-browed, almost as vivacious as a Frenchman, who, while serving the Russian government at Dorpat, and while raising to himself a monument of original research, has managed to retain all his German ways and feelings, and his German love for fatherland. Two years ago the writer of this article expressed to him wonder that the Russian government would maintain, in the face of the semi-hostile feeling between it and Germany, a practically German university in the Russian town of Dorpat. "It is because we are necessary to Russia and the Russian army," said the professor. "Each year we send one hundred and fifty trained men to the Russian army medical staff, and, so long as this goes on, the Russian government will keep us in its employ." It seems, however, that this forecast of the mind of the almighty Czar, or, perhaps, to put it more correctly, of the bureaucracy which tyrannize Russia in the name of the Czar, was not accurate, and so the University of Dorpat is to be closed; and in middle life, simply with a record of devotion to abstract science, Professor Kobert and his colleagues are to be thrown upon a world that cares only for science as it ministers to need. This winter's work may possibly add another leaflet to the pharmacological researches of Dorpat, but that must end it. There is, after all, something that is harder on the individual than the American method of teaching the would-be scientists in the beginning, that the bread-getting must be aside from scientific labor, and that the stolen hours of life alone can be devoted to the highest work. H. C. W.

Correspondence.

TERPINE HYDRATE IN HAY-FEVER.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—The priority claim of Dr. Loebinger* in the employment of large doses of terpine hydrate in the treatment of hay-fever is highly absurd. He claims priority, and yet states that "Lépine and Germain Sée, in France, and Lazarus and Manasse, in Germany, were the first to point out the correct dose of the remedy."

I employed terpine hydrate four years ago in the treatment of hay-asthma, bronchial asthma, and bronchitis; that is just two years previous to the doctor's appearance in this country; and, if the doctor's memory were not so poor, he might recollect that I referred him to one of my articles on hay-fever in the THERAPEUTIC GAZETTE (May, 1890), in which he would find the statement of the

* THERAPEUTIC GAZETTE, February, 1892.

employment of terpine hydrate in hay-asthma for the first time.

When he spoke to me of the large doses of the quoted remedy (by the way this happened in a coach of the elevated road), I said to the gentleman that "I am aware of its efficacy, as I have used it for the last four years in asthma, etc."

When I received the proof-sheets of my last article in the THERAPEUTIC GAZETTE on hay-fever, Dr. Loebinger was present in my office, and I confidentially handed the sheets to him. He read the article, and at once claimed priority. I referred the doctor to my articles in medical papers, as well as to several drug-stores, where he could find my prescriptions written two years ago, with *large doses* of terpine hydrate; but all in vain. He claimed his "pound of flesh" in spite of it; went forth, and *prima furia*, prepared an article in German, which was translated *brevi manu* and published in the *New York Medical Journal*, in order to be first in the field, and thus secure his coveted priority.

In reference to the remark of the doctor that my explanation—small doses create secretion and large ones restrict—was incorrect, I will not speak of my own experience, but will refer the doctor to his cited authors, and especially to Drs. Germain Sée and Lazarus. The latter says, in *Therapeutische Monatshefte*, August, 1887, "Terpine hydrate is indicated in cases where violent irritation of the bronchial mucous membrane exists, and where the secretion is peculiarly viscid, such as is met with in the chronic catarrh accompanying emphysema and phthisis. The effect obtained is always an increase and a liquefaction of the secretion, a considerable reduction of the irritation, and easy expectoration." Dr. Lazarus's doses for twenty-four hours have been 25 to 30 grains, which I do not consider large doses. My experience with about fifty cases of hay-asthma has given me the results I reported.

ALEXANDER RIXA, M.D.

1268 LEXINGTON AVENUE, NEW YORK.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I note with pleasure what Dr. Gundrum writes in your February issue concerning his success in the treatment of sciatica by the local depletion of blood. My own experience has been identical with his. More than forty years ago my father told me of having cured cases of sciatica in two or three days by this method, and while I could scarcely believe that this was true, knowing the extraordinary obstinacy of the disease, ample experience since that time has convinced me that he was correct. Indeed, I have not failed in a single instance to get such perfectly satisfactory results that I now habitually promise a patient on the first visit that I will cure him in two or three days. Two things are essential in the application of this treatment. First, that there are three points and no more in the course of the nerve in question, at one or more of which, but almost always only one, pressure will reveal great tenderness. These are (1) against the sacro-iliac synchondrosis; (2) behind the great trochanter; and (3) in the popliteal space. It is to the tender spots that the cup is to be applied. The other points to be attended to are that you get a considerable amount of blood, at least two or three ounces, and this is particularly the case when the trouble is behind the great trochanter, which, by the by, is the commonest seat of the disease. In fleshy subjects this free depletion is absolutely essential, for the nerves affected lie deeply, and it is from the engorged vessels in the vicinity that depletion is necessary. For this reason cups are more effective than leeches, and a common tumbler, if it has thin edges, is even better than the cup.

I wrote of my success in the treatment of sciatica by this means many years ago in one of the New York journals. Whether my professional brethren will see fit to adopt these results and to employ this remedy is perhaps doubtful, as there are so many "sure cures" written of in the journals of to-day.

Respectfully yours,

C. C. P. CLARK, M.D.

OSWEGO, NEW YORK.

PRESCRIPTION FOR HÆMOPTYSIS.

L'Union Médicale states that BAMBERGER recommends the following prescription in cases of hæmoptysis:

℞ Powdered alum, gr. xxx;
Hydrochlorate of morphine, gr. ½;
Powdered white sugar, ʒi.

Sig.—Make into six powders, and give all of them in divided doses in the space of three or four hours in cases of profuse hæmoptysis, with cough.

Keep the patient absolutely quiet, and apply mustard-plasters and external heat to the extremities.